

Challenge

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from the editor

a personal note

■ ORDINARILY one wouldn't expect too much similarity between the glamor world of television and the basic world of steel. Yet, in recent weeks both have provided engrossing headlines which bespeak substantial failings of a similar order.

From all the moralizing done about the TV quiz show scandals one fact stands out: the broadcasting industry and its affiliates have worried more about the almighty dollar than about the public interest. I think we have here still another example of the erosion of moral fiber that has dramatically come into evidence since the inception of the cold war.

Having been forced to look at ourselves—because the Communist challenge has put us under such close scrutiny—we are often surprised and even distressed to find that we are quite different from what we say we are. What do we do when we learn the truth? We put out statements to the effect that, in spite of all the disclosures, most people still want quiz shows, fixed or otherwise.

Enormous harm has been done by the TV scandals. Of all the folklore about America, there was one notion that seemed impregnable—namely, that a man with knowledge and information could command a good price. Now that too is gone. Apparently the only way such a man can get ahead in America is to have all the answers in advance.

The fatuousness of the television

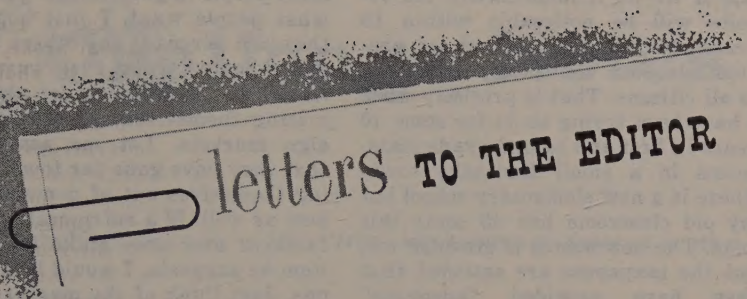
industry is typical of its own failings. Having neglected to police itself before the scandal broke, it has now suggested that it should be policed by everyone. And it will be! Does anyone want to know where freedom in free enterprise is going?

In the closer-to-life world of steel we find the same gaping holes in the mantle of principle. Collective bargaining has been discredited. The Taft-Hartley Law has been rendered useless. The government's hands-off policy, once applauded, is now ridiculed as naive.

Management claims that the minimum union demands are unworkable, inflationary and destructive to the equilibrium of the industry. The union claims that management wants nothing short of total victory, which means union-busting. Few, as far as I can tell, including government figures, have admitted publicly that gigantism has bred separate forces *not united on principles*. Each great pressure group is on its own and for its own. Each acts as though it lives in isolation from the others. Apparently this diversity of purpose encourages stalemates and invites federal action.

It is now apparent that both sides in the steel dispute decided some time ago to "stand firm" until someone else could take the responsibility for studying the issues and dictating the terms. Like big-time TV, big-time Steel and big-time Labor have invited in big government. No one can blame the public if it believes this is as it should be.

But is this as it should be? Are we not drifting more and more toward a quiet acceptance of authority whenever a consensus seems difficult to achieve? This is enterprise *without* freedom.—H. B.



letters TO THE EDITOR

Mysterious cycles

• Mr. Woytinsky in his article ["New Business Rhythm"] in your October issue speaks of "widespread recognition of a definite new rhythm in our economy—a regular succession of four-year cycles" for the past 12 years.

It seems a somewhat unscholarly and dangerously misleading approach to look for mysterious cycles instead of checking the actual and obvious causes of recent fluctuations. In 1947, Woytinsky predicted recessions for 1949, 1953 and 1957. The industrial production index in 1949 was 97 as against 100 in 1947. That's not much of a recession. In 1953 the Korean war came to an end and the new Administration took its first timid steps toward a "sound" tight-money policy. It is purely accidental that these two events took place in 1953, and the resulting recession can therefore not be ascribed to cyclical influences.

Scared by the effects of its policy, the Federal Reserve Board lowered the discount rate in February and again in April of 1954. All went well until in 1956 the healthy development was again slowed and then stopped by a renewal of the tight-

money policy. In spite of clearly visible signs, like cancellations of industrial expansion programs, a decline in housing starts, a weakening of the stock market and warnings by economists, this policy was continued until November of 1957. Thus, this recession too, as the then Governor Harriman of New York said, was "man-made."

As soon as the tight-money policy was, temporarily at least, abandoned, the recovery started. Right now, the tight-money policy has again reached a critical point and it will depend on the decisions of the Federal Reserve Board whether or not it will lead to another recession.

Generally speaking, cycles can appear in developments subject to natural elementary forces. It makes little sense, however, to look for them in events subject to unpredictable human activities.

WALTER VON FELDAU

New York, N.Y.

Preventing human failure

• Author Smuts admits that we already know many of the causes of human failure [October, 1959]. We can do something about the problem

and if we do it immediately the results will be noticeable within 10 years. Smuts suggests that we provide adequate elementary education to all citizens. That is precisely what I have been trying to do for some 40 years in first and second-grade classrooms in a small Kentucky town. There is a new elementary school but my old classroom has 45 seats this year. The new school is crowded too, but the taxpayers are satisfied that they have provided "adequate" schools. Kentucky provides its quota of "human failures," and I have 28 children from such homes. All of these, plus a few others are, at present, slow learners. If I could devote all of my time to these children, most of them would develop average skills in reading and numbers and, of course, a pride in their accomplishment that would transform them into eager pupils. This transformation is not to be taken lightly—a child senses failure at an early age and becomes resigned to it, especially if his parents are already resigned to failure. However, I must remember that I have 45 students, not 28.

A KENTUCKY SCHOOLTEACHER

- Congratulations, author Smuts, on your important and stimulating article, "The Causes of Human Failure," which I have just read in **CHALLENGE**. The subject is tremendously important and what you have to say surely must be of interest to all thinking people.

PROF. J. PHILIP WERNETTE
University of Michigan

Ann Arbor, Mich.

Indian-American agreement

- Your October interview with Bradley Fisk proves that there are

some people in government who know what people want. I just hope that they can persuade the others to provide what we want. Fisk warns that American manufacturers may be pricing themselves out of some foreign markets. Let me assure him that they have gone far toward pricing themselves out of domestic markets as well. If a refrigerator manufacturer ever does make the \$49.50 item he suggests, I would love to buy one. Just think of the market for an additional refrigerator without freezer, ice-cube dumping mechanism, etc., for home use.

R. M. NEUBERGER

Berkeley, Calif.

Political zeal or business acumen?

- Mitchell Gordon's article on "The Problems of Pemex" in your November issue should be required reading for all chest-thumping xenophobes who, by virtue of nationalizing a foreign-owned industry, proclaim themselves the saviors of their respective nations. Political zeal can never replace business acumen in running an industry. The path of history is strewn with the near-wrecks of such attempts. Iran, Indonesia, Egypt, Iraq, Syria—and now it seems to be the fad in South and Central America.

"How long, oh Lord, how long?"

MANLEY D. DODSWORTH

Jasper, Wyoming

Bravo

- The interview with Dr. Harrison Brown [November, 1959] was by far the best I have read in two years as a subscriber to **CHALLENGE**.

HARRY NEILANDS

Oneonta, N.Y.



Challenge Notes

Featherbedding as a way of life; "free" entertainment; fame at a price

■ ONE NOVEL FEATURE of this year's dreary labor-management battles has been the relative unimportance of wages. Unions actually settled for less money during the third quarter. Even if the United Steel Workers and the railroad brotherhoods win major concessions, it is unlikely that over-all *wage* costs will rise substantially. And most experts agree with a recent report by the Bureau of National Affairs predicting that negotiated wage increases will be even more modest in 1960.

What is causing all the controversy is management's contention that any increase in *wage* costs will inevitably force up *labor* costs, unless work rules are revised and "featherbedding" practices are eliminated. Management claims—and most impartial observers agree—that such practices make it difficult to introduce cost-saving innovations. The unions reply—and they also have a strong case—that many of the cost-saving innovations that

management has in mind are, in fact, labor-saving and will eliminate jobs (and dues-paying members).

The public's disgust with this ritual dance of rationalization and counterrationalization is understandable; it is also a little disingenuous. Featherbedding, as the unions have been quick to point out, is not unknown in executive suites. Every assistant vice president is not indispensable. Nor is every expense account (even if actually expended) really necessary to keep the wheels of industry going.

As a matter of fact, featherbedding is a time-honored practice in every sphere of American life. Bureaucrats who insist on having *three* assistants, students who take courses in roller skating and quiz contestants who want to get rich without working, have one thing in common: a desire to get something for nothing. And since all true innovations tend to upset time-

honored ways of doing nothing, they will always have their opponents. Until we recognize the mote in our own eye, what right have we to complain about the number of train conductors who, the unions insist, are absolutely essential to keep the railways running as efficiently (sic) as they have in the past?

"Free" entertainment

There is one economic aspect of the recent TV quiz scandals which has not received the attention which it deserves. Television, unlike any other product or service, is not directly paid for by the consumer. Of course, the consumer pays indirectly when and if he buys the products of sponsors who must eventually incorporate their advertising costs into the price of soap, bubble gum, perfumes, etc. But this process is so indirect that, for all practical purposes, the entertainment offered over the airwaves is free.

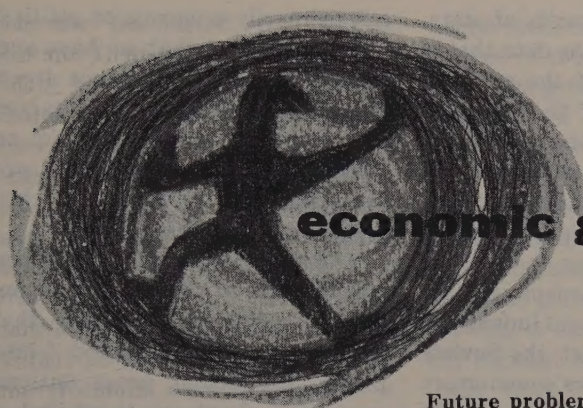
Does the consumer really benefit from this arrangement? In many ways, he undoubtedly does. Given the prohibitive costs of modern communications (and this applies increasingly not only to television and radio, but also to newspapers and magazines), it is doubtful whether much of the entertainment currently offered over the airwaves would ever reach him if there were no sponsors. This, in some cases at

least, would be a net loss. But the consumer also pays a price for his "free" entertainment. For, the sponsor who pays for his entertainment is primarily interested in developing a market for his products and only incidentally in entertaining his audience. Sometimes the two go together; sometimes they do not.

There is increasing evidence that sponsors are beginning to realize that the size of an audience is not the best index of the size of his potential market. This is particularly true in those cases where the advertiser, rather than the consumer, pays most of the bill. While this is impossible in television, more and more advertisers are shifting to the more specialized printed media where the consumer's willingness to pay for a specialized editorial product makes it more likely that he can also be persuaded to buy the advertiser's product.

Fame at a price

Do you want to make your dream come true? This will *really* impress your friends. You, too, can "show all your friends you have lived dangerously." All you need to do is enclose \$2.98 and your name can be immortalized on a "genuine bullfight poster" featuring pictures of "other matadors." What price glory now? Answer: \$2.98.—M. K.



economic growth

Future problems and prospects

by the editors of Challenge

■ AMERICANS, either consciously or unconsciously, have always been concerned with the problem of economic growth. The interest of the average citizen in this problem is usually the mundane one of raising his family's living standards. In this era of competitive coexistence with the Soviet Union, however, the future well-being of the family and the survival of the nation may very well depend not only on our ability to increase living standards, but also on the growth rate of the national economy—two objectives that are not necessarily the same thing. How then can we increase both our living standards and our rate of growth, and in this context determine the prospects for the future of the American economy?

Although it is by no means precise, the best available measure of

economic growth is gross national product—the value of all the goods and services produced by a nation's economy in a given period. In terms of constant 1954 dollars, the gross national product of the United States rose from \$181.8 billion in 1929 to \$395.4 billion in 1958. Since 1880, the GNP has grown at an average rate of three per cent per year. However, since 1948 the average rate of growth has been four per cent. Within the latter period, there was considerable fluctuation in this rate from year to year. For example, the gains in 1956 were relatively small following the exceptionally large advances of 1955. Similarly, 1959 was a banner year—in spite of the steel strike—compared to the recession-shackled 1958.

In measuring Soviet economic growth, we are faced with the im-

ponderables of a dearth of data, and the accuracy of the data that is available. Because of the struggle for the allegiance of the underdeveloped countries, whose primary concern is the industrialization of their relatively primitive economies, it is in the Soviet interest to distort statistics so as to convince others that communism is the quickest avenue to rapid industrialization. In this context, the Soviets argue that in 40 years communism has made a backward, largely agrarian Russia the world's second industrial power.

Emphasize heavy industry

In evaluating the speciousness of Mr. Khrushchev's assertions concerning the increasing rate of Soviet economic growth *vis-a-vis* that of the United States, it should be pointed out that the annual rate of growth in a highly developed, consumer-oriented economy like that of the United States would normally be less than that in a less-developed, heavy industry-oriented economy like that of the Soviet Union. Since the founding of the Soviet State in 1917, the various Five- and Seven-Year Plans have strongly emphasized the primacy of heavy industry over the consumer goods industries. A private enterprise, political democracy like the United States, on the other hand, has an economy based on a consent society which has values

not primarily economic or political.

The very fact that we have such a political economy makes it extremely difficult, in many instances, to convince the former colonial nations that our type of society presents the best alternative to their present backwardness.

The most recent reliable comparison studies of the American and Soviet economies indicate that, when measured in United States prices, the Soviet gross national product is about one third that of the U.S. About 25 per cent of this GNP is devoted to military expenditures as opposed to approximately 10 per cent in the United States. Consequently, despite the disparity in our respective GNPs, the Soviet industrial capacity to wage war is probably equal to ours. However, because of internal political pressures, the Soviet government is being forced to reassess these policies in the light of the demand of the Russian people for a better life.

In this context, the Soviet government issued a new decree calling for an immediate increase in the production of consumer goods, accompanied by new designs and better quality. This decree set a 1962 consumer goods production goal at a level which is 42 per cent higher than 1958. Interestingly enough, Premier Khrushchev has adopted the consumer goods policies for which he so vehemently

criticized his ousted rival, former Premier Georgi M. Malenkov.

The vast difference in economic allocation between the two countries is exemplified by the components of our gross national product, which was at a projected annual rate of \$484.5 billion during the second quarter of 1959. The principal component was personal consumption expenditures at a rate of \$311.2 billion in current dollars. This included durable goods at a rate of \$44.1 billion, nondurable goods at \$147.7 billion and services at \$119.4 billion. The other principal components of GNP were gross private domestic investment at \$77.5 billion and government purchases of goods and services at \$97.7 billion. The latter is broken down into \$53.9 billion for the federal government and \$43.8 for state and local governments. Of the federal expenditure, \$46.2 billion was for national defense.

Growth and money

It is axiomatic that continuing growth requires enough money in the hands of the consuming public to purchase the increasing number of goods the economy is producing. The best indicator of the amount of money in the hands of the consuming public is disposable personal income which, in constant 1954 dollars, went from \$134 billion in 1929 to more than \$300 billion in 1958. These figures provide

ample evidence that the disposable income of consumers has increased right along with the growth of the economy. In constant dollars and after payment of taxes, personal income is now 11 times what it was in the 1880s.

The significance of this great rise in personal disposable income, from the point of view of economic growth, is its diffusion throughout our society. More and more Americans have reached middle-class status with an increased amount of discretionary spending power at their disposal. In constant 1958 dollars, the percentage of American families earning more than \$6,000 per year has risen from 27 per cent in 1947 to 39 per cent in 1958.

It is also self-evident that continuing economic growth must depend not only on increasing consumer expenditures, but on increasing investment in plant and equipment. The capital for this investment comes not only from undistributed corporate profits and from those who buy shares in businesses, but from savings funneled into investment channels by institutional middlemen. Thus, additional capital that is critical for economic growth comes from the sale of new issues of stocks and bonds on the securities markets. Other funds come from the monies which savers entrust to banks and other financial institutions.

The ratio of personal saving to disposable personal income has gone from 5.5 per cent in 1940 to an estimated 6.4 per cent in 1958. This has remained a relatively steady figure over the past 19 years, except for 1945 when the ratio climbed to 18.6 per cent, mirroring the nonavailability of consumer goods during World War II. The fact that there has been some rise in personal savings, although small, appears to nullify the contentions of some economists that Americans are not saving enough for future investment.

The service sector

A factor which could conceivably retard our future growth rate is the increasing percentage of the labor force employed in the service sector of the economy. Productivity has risen very slowly in this sector, while employment has shown the most rapid gains of any segment of the economy. Between 1945 and 1958, there was no significant increase in output per worker, while employment rose 40 per cent. The expanding services—government, finance, transportation—are nevertheless vitally necessary to the long-run growth of the national economy.

An increasingly significant area contributing to economic growth is the expenditures of the federal, state and local governments for education, highways, hospitals, etc.

Expenditures for education should increase rapidly in the years to come under the stimulus of Soviet boasts about the efficiency of their educational system. In 1958, more than \$13 billion, representing about three per cent of the gross national product, was spent on public school education alone. This does not include the vast sums spent for private education and the universities and colleges. In 1950, about \$5.9 billion, representing about two per cent of the gross national product, was spent on public school education. Expenditures for health and hospitals are still lagging, although state government expenditures in this field rose from \$311 million in 1942 to \$1.9 billion in 1957. State government expenditures for highways rose from \$1.1 billion in 1942 to \$5.9 billion in 1957.

The expenditures for research, which leads to the invention of new products, processes and techniques, are better organized than ever before. Expenditures from nongovernmental sources alone have risen from \$800 million in 1945 to almost \$6 billion at the present time. The federal government is spending a somewhat smaller amount for research and development, principally in the area of military technology and atomic energy. More than half of this government research is being performed by private contractors.

It is clear, then, that a continually increasing rate of economic growth is dependent on both governmental actions (federal, state and local), and the decisions of private individuals. The governmental role in economic growth has expanded enormously in the past 25 years, with the advent of the New Deal, the Second World War and the subsequent cold war. Federal, state and local governments now buy one-fifth of all the goods and services produced by our society as opposed to one-twelfth in 1929. One-sixth of all the personal income in the United States flows to recipients directly from government sources.

Decisions to spend

Although governmental expenditures play an important role in stimulating economic growth, we must not overlook the greater importance of the decisions of private individuals to spend, save and invest. For example, personal consumption expenditures are running at a projected annual rate of more than \$311 billion for 1959, while industry's expenditures for new plant and equipment this year are at a projected annual rate of about \$35 billion. These figures clearly demonstrate the importance of private decisions in stimulating economic growth.

These individual decisions can, of course, be either encouraged or

discouraged by fiscal and monetary policies. The Federal Reserve Board can, to a large extent, control the supply of money by, for example, raising or lowering the discount rate and the reserve ratios of member banks, and by buying or selling government bonds in the open market. This can expand or contract the amount of credit business can obtain for new investment in plant and equipment and the amount which consumers can obtain for new installment purchases.

Government can encourage new private investment in preferred sectors of the economy by increasing the depreciation rate on the new equipment for tax purposes, i.e., fast tax writeoffs. Individual initiative can also be sparked through adjustments in the capital gains and the personal income taxes. For example, the government has encouraged small investors to invest in industry by exempting the first \$50 in receipts from corporate dividends from income taxes. It is obvious that if tax rates become confiscatory, the all-important incentive to work and save for oneself and one's family is thwarted.

If a lessening of cold war tensions should result in a decrease of the approximately 10 per cent of our gross national product devoted to defense expenditures, the federal government could divert these funds to the support of schools,

highways, health and research, which would have a far greater effect on our real growth than defense expenditures. It could also redirect these funds into private hands by lowering taxes. Although national defense spending does aid growth in some ways, such as in the development of new machines and techniques which could eventually be used in civilian industry, on the whole, the money spent on this area would be far more significant to our economic growth if it were spent in other ways.

Since the average long-term rate of GNP growth has been three per cent and the growth since 1948 has averaged four per cent, there is no reason to assume that we cannot maintain at least a three per cent annual long-term growth rate. Assuming this, by 1975 the gross national product of the United States will exceed \$725 billion in constant dollars. Taking into account projected population growth and as-

suming a continuation of present tax rates, this would mean an average family income, after taxes, of about \$7,100. If the average long-term growth rate rose to four per cent, this income would exceed \$8,500, and if it fell to two per cent, average family income in 1975 would be \$5,900.

Given wise public policies, coupled with increased incentives to private individuals to save and invest, the American economy, which has seen output per worker increase fivefold since 1880 through the application of technology, should continue to grow at a rate equal to, and probably higher than, the three per cent average long-term growth rate of past years.

Whether this growth rate will be enough to outpace the Soviet Union is problematical. If the answer is no, we may have to modify some of the basic tenets of our consumer-oriented consent society in the interest of self-preservation. ■

Supermarkets' New Appeal

COMPETITION among supermarkets (every new market that opened last year had to compete with an average of four other markets in its area) has forced managers to make unusual efforts to capture the shopper's fancy.

In Fort Wayne, Ind., one market installed a 28-foot wading pool, stocked it with goldfish and distributed coupons to children which entitled them to a catch of two fish apiece. The same market also held a corn roast under its 12,000-square-foot marquee, selling one hot, buttered ear of corn and a cup of milk for five cents.

A Florida market is constructing a carpeted ladies' lounge with a complete library of cook books.



Affluence, Softness and Growth

A sociologist offers a few words of
gentle praise on behalf of money

by Wilbert E. Moore

■ THROUGHOUT world history, and indeed in most of the modern world, human poverty is the rule and prosperity the exception. Economic well-being has commonly been limited to small privileged classes, justified in their positions by ideologies ranging from allegations of "natural" superiority to assumptions of divine grace. Counterparts of such rationalizations have been platitudes for the poor. Poverty, or at least struggle and adversity, has a long association with virtue. Surfeit, it is argued, leads to softness, while adversity ennobles the character and may even be rewarded by hard-won material improvement.

The dangers of wealth form a recurrent theme in the traditions

of the Western world. The dangers are partly those of divine retribution for arrogant self-indulgence, partly those of overturn and defeat at the hands of the virtuous poor, domestic or foreign. The assumedly paralyzing effects of prosperity have long been used to explain the superiority of Sparta over Athens, the Northern barbarians over decadent Rome, or the contemporary Soviet challenge to American world power.

Our first paradox now appears. We know that poverty also paralyzes, and that prosperity may provide both the means and the motives for further growth. The saying that "nothing succeeds like success" cannot be dismissed with

casual cynicism when we have such ample evidence, both in personal psychology and collective behavior, that nothing fails like failure. It is even doubtful that anxiety is as effective a stimulant to creative effort as early and frequent rewards for accomplishment.

Specific worries

These generalities form a background to the discussion of some specific worries that trouble a number of commentators on the current American scene. Are we going soft? In an economy where so large a majority of the population enjoys such material well-being that the society as a whole can be called "affluent," are we in danger of living so well that we imperil our capacity for sustained growth? Can we justify our privileges while keeping our world neighbors contented? Will we use our wealth in ways that insure our political survival?

The questions are not rhetorical, but open. Yet there do appear to be grounds for cautious optimism, or at least for reducing anxiety below the level where it is debilitating.

Let us take first the claim that Americans increasingly stress immediate *versus* deferred gratification in their economic planning. This is what is meant by the so-called decline of the "Protestant ethic." Although not strictly a doc-

trine of work as the way to salvation, evangelical Protestantism did encourage frugality, responsible trusteeship of money, avoidance of conspicuous consumption, and thus encouragement of savings and re-investment.

The notion of current decline from past virtues is another recurrent theme in both Western and world philosophy. The idea of "primitivism," with its implication that progress consists of going backward, is properly subject to grave distrust, if for no other reason than the distortion of history that nostalgia encourages.

There is a considerable array of evidence against the thesis that Americans show a decreased interest in and capacity for taking thought of the future. The two principal sources of economic decisions—businesses and families—tend to lengthen rather than shorten their planning horizons. Life insurance, pensions and long-term savings plans (including home mortgages) scarcely square with the notion of exclusive preoccupation with immediate indulgence. Nor do long-term investments by corporations, such as the 100-year "timber farming" cycles of large lumber companies, indicate a tendency toward improvident plunder.

Rising minimum levels of living and some reduction of income inequalities have, in fact, broadened

the base for private savings. In the changing structure of the American economy, private savings tend to be converted into investments by institutional intermediaries. The corporation itself is a type of "institutional investor" by its capacity to reinvest a part of its earnings. Banks, insurance companies, pension trusts and the purveyors of "mutual funds" are the other principal mobilizing agencies.

Savings and investment, gross or net, remain a remarkably constant proportion of the gross national product. The composition of such investments varies through time, and there may be legitimate worries concerning the maintenance of appropriate flexibility in the economy's capital equipment; but it does not appear that we are collectively living up to, or beyond, our income.

Equity investments

A little further evidence that the character of the American economic man is not softening may be gleaned from equity investments. Growth stocks and prospective capital gains appear to be distinctly favored over stocks yielding relatively high current returns. This argument, of course, cannot be pushed very hard as evidence of "deferred" gratification if the investor maintains a very active portfolio and "realizes" his capital gains at frequent intervals just

long enough to get his income tax advantage. And it must also be noted that the institutional investors, by identifying a limited list of "growth stocks" for regular purchase, may make their identification self-confirming.

Nevertheless, the idea that affluence is softening the American character is exaggerated. But this does not mean that there is nothing to worry about. The institutionalization of investment decisions and the bureaucratization of developmental technology may lead to excessive caution. There are some hints that large corporations abdicate rather than abuse economic power, at least with respect to innovation. More exactly, low-risk process changes seem favored over high-risk product changes. Of course, living dangerously was never very attractive to very many, but the peril of prosperity is that it permits so many to avoid risk and still prosper.

There is another argument on the strategy of economic growth: Should the emphasis be on more consumption or on more consumers? In the short run, does the one rule out the other? This is a particularly serious question for underdeveloped countries. These countries face extremely difficult problems in their attempt to accomplish three goals simultaneously: satisfaction of rising aspirations of present populations; the support of

rapid population growth; and capital accumulation sufficient to insure continuous, rapid growth.

Even when sterilized of Marxian polemics, history tends to show that rapid growth under early Western capitalism was achieved in some measure by "exploitation" of workers. And, ironically, it is also true that Communist states have coupled political with economic power to control current consumption and achieve high savings ratios. Yet Communists have doctrinally rejected population controls and thus eschewed one possible way of gaining both current and future increases in per capita income.

Ghosts and spirits

If the ghost of Malthus hovers over India, the spirits of mercantilists guide the hands of Western economic forecasters. Population growth, in the latter arena, is seen as a source of positive pressure for economic expansion.

The situations are different. But leaving aside the demographic question, problems remain in the strategy of economic incentives and market operations. Without totalitarian controls, it appears unlikely that an underdeveloped country can achieve economic transformation with no current improvement in living standards, or by imposing further degradation. In an enterprise economy, or in the pri-

vate sectors of a mixed economy, expansion of the local market by expanded consumer purchasing power is likely to stimulate domestic and foreign investment. And it seems fair to add that improved levels of living may be a necessary compensation for tolerating revolutionary changes in social structure, tradition and conduct. In fact, the administrative costs of terror in a totalitarian regime may well outweigh the costs of production for current consumption.

So far, we have assumed that rapid capital growth is essential for continuous growth in per capita income. But this is only true within limits—limits imposed by the need to maintain a labor force and to provide for the survival of the young, for whom, or for whose descendants, the whole attempt to build the future is intended.

It is also true that investment in heavy industry and capital goods is often made not only for the strictly economic purpose of future production but partly for the political purpose of "defense," international power or "survival." Whether or not this type of expenditure is waste, it is made for more than economic reasons.

Democratic governments depend upon popular consent as to which tax-supported expenditures are for *either* survival or future growth. For example, private educational

investments for assured future returns in the professions are made somewhat more easily than expenditures for upgrading public education as a whole. It is also noted, with perhaps exaggerated cynicism, that both private and public funds can be more easily secured for monumental buildings than for the salaries of monumental teachers. Yet citizens do constitute themselves into pressure groups for better schools, and the competition for teachers does eventually introduce market principles into the determination of their rewards.

Goals and means

The perils of an unregimented prosperity lie less in an unwillingness to sacrifice than in slow, inept and vacillating identification of goals and means.

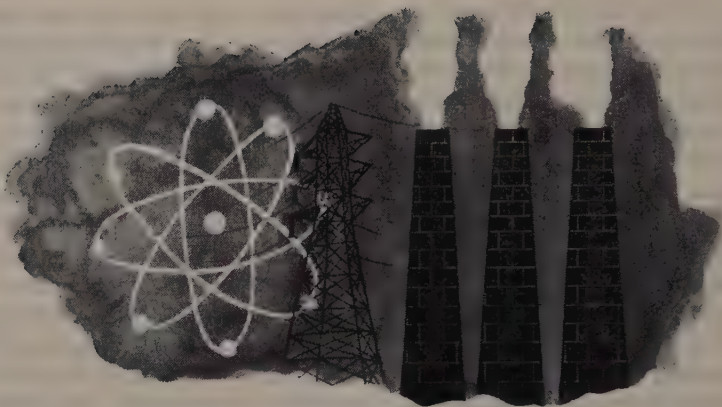
Finally, a few words of gentle praise may be offered on behalf of money. Money-mindedness is often equated with crude materialism. This equation, often accepted by Americans with defensive guilt, is partly spurious. It is an inherent characteristic of highly developed industrial economies that the num-

ber and proportion of goods *and services* that move through the market steadily increases. The upgrading of consumption standards applies to *both* goods and services. With increasing manufacturing efficiency and growing uniformity of material consumption standards comes an expansion of services. The possible further reduction of the industrial labor force will create an even greater demand for services and increased productivity of service occupations, if continuous growth is to be achieved.

Meanwhile, the world's materialists are perforce the have-nots and not the haves. For the latter, a crowning paradox appears. Prosperity brings an absolute and proportional rise in "discretionary income." As money becomes increasingly essential for maintenance of the good life, it loses its utility to predict just what the good life is to the family budgeters. When we understand this point, we can begin to comprehend the wondrous diversity that belies attempts to picture prosperity as stultifying to creativity and destructive of individuality. ■

Making Money Legally

THE U.S. TREASURY makes several million dollars yearly on the coins it mints. Profit is made because the metal that goes into the coins costs less than their face value. For example, the government uses only 12 cents worth of metal for every one dollar's worth of nickels.



THE SINEWS OF GROWTH

Greater emphasis on energy factors will ease
the depletion of natural resources

by Conrad Seipp

■ THE UNITED STATES currently consumes more than half the exhaustible resources being withdrawn from nature each year throughout the world. Furthermore, the world-wide use of such resources is increasing at a rate probably twice that of economic growth in general. Clearly, this situation cannot continue indefinitely.

Much that has been written, especially since World War II, emphasizes the limited extent of the world's resources. Such studies have usually concentrated on the difficulty, if not the impossibility, of attaining sustained world-wide economic growth in the face of "uncontrolled" population increases in the less-developed and more

densely populated areas of the world. At the same time, appraisals at the other extreme have assured us of the adequacy of the world's resource base for the realization of at least the more immediate social objectives of mankind.

In general, those who have sounded the alarm at the rate at which the natural wealth of the planet is being exhausted usually view resource wealth as some kind of bank account or reservoir from which only withdrawals are made, with the consequent depletion of the initial store. Others, however, concentrate on the changes wrought by time in our resource base. New resources, they argue, are constantly being discovered,

made usable and added to our total stock of resource wealth. Technological development has secured new sources of materials—witness the recovery of magnesium from the sea, the extraction of oil from shale or the production of aluminum from clay.

No less important is the harnessing of other natural resources for energy. The scientific advance which has made available to man the energy of the atom is but one example of this potential. Technological progress also often makes it possible to reduce the amount of resources required per unit of production, as exemplified in the increase in the thermal efficiency of fuels used in electric power production and transport.

The speed of recent technological advance precludes acceptance of the view that future economic growth will be hampered by dwindling stocks of natural wealth. For it is clear that much of today's technology will expand the effective resource base upon which economic growth depends. The most far-reaching effect of technological development on resource use involves the ratio of resource stock used as energy to that which is employed as matter. Whereas the consumption of exhaustible resources employed as matter has increased arithmetically (1, 2, 3, 4, 5, etc.), the consumption of energy has mounted geometrically (1, 2, 4, 8,

16, etc.). A progressively larger share of the world's resource potential will continue to be employed to produce energy. This increase in energy can insure the availability of the resources needed as the materials of production.

The influence of technological development on resource use does not stop here. In general, the shift from the smaller productive unit to large-scale automated production has reduced resource waste and facilitated the recovery of by-products. The higher capitalization of productive enterprises has reduced the resource orientation of production to a significant extent. This latter trend has been reinforced by a greater integration of production and by the emergence of closely related productive systems. These developments help decrease the cost of basic resource procurement.

These are some of the factors in changing resource needs today. But what about the more distant future? Currently, the annual per capita production of steel in the U.S. approaches three-quarters of a ton and the annual per capita production of cement exceeds one-third this amount. Annual per capita water consumption is about 150,000 gallons. (It is estimated that roughly 60 per cent of irrigation water and 10 per cent of the industrial and domestic supply actually disappears.) Approximately 1,000 kilowatt hours of electricity

are consumed annually per person for residential use in the U.S. and this is only one-fourth of total production.

Comfort and convenience

When resource needs of the dimensions which these figures suggest are projected for all of the world's people, the supply of essential materials becomes a different problem from the one which exists today. It is clear that substantially the same level of comfort, convenience and well-being enjoyed in the U.S. can now be made available elsewhere in the world with a far less lavish use of natural resources. However, by the time this goal can be achieved, the number of persons seeking it is likely to be several times its present size. Will there be enough to sustain the amount of economic activity necessary?

Well before the whole world becomes highly industrialized, supplies of easily mined iron ore will have been expended. We will then have to rely on the processing of low-grade ores, entailing far greater technical complexity and much more energy per unit of product. It seems certain that aluminum and other materials will be further substituted for steel; yet this, in turn, will hasten the exhaustion of bauxite reserves. This will necessitate a shift to other aluminum-bearing substances, such as anorthosites and clays, with the resultant cost

of more technology and a greater expenditure of energy.

The problems likely to be experienced in so great a transformation should not be minimized. Important periods of maladjustment must be anticipated. For example, limited copper reserves will soon require the processing of progressively lower-grade ores and relying on substitutes—frequently with a loss of efficiency in both operation and fabrication. Both alternatives point to the need for more energy per unit of output.

Apart from specific future resource shortages, it is certain that the limits set by the carbon cycle and the water cycle will demand that mineral resources be secured from the very low concentrations present in igneous rock and ocean water.

Reuse of water

A similar transition must be anticipated in food production. Traditional agriculture is certain to be gradually supplanted by more efficient methods of food and fiber production, such as chemical synthesis and the commercial raising of algae. The water made available from the water cycle, at least in the temperate zones, will be fully collected and used and reused until consumed. Even then, supplies secured from salt water will become increasingly important. And here again the energy required to make

a given quantity of water available in the quality and at the place it is needed will increase.

It is possible to visualize an extended state in which the world will rely for its resource needs on atmospheric gases, sunlight, ocean water, rock and low-grade ores. The availability of raw materials will depend primarily upon the availability of energy, given the necessary requisite technical advance. While the potential of energy production is presumably finite, it seems difficult in view of recent technological developments to envision it as a serious limiting factor on continuing economic growth. Rather, the relevant question today is the probable cost of supplying the energy required.

This view of the more distant future helps to clarify the character of the transitional period which lies immediately ahead. As natural resource use continues to increase, the steady state resource technology will rapidly take hold in some areas of the world, while in other cases existing techniques of resource procurement will continue to be employed. However, the gradual exhaustion of the most available natural resources will cause a general leveling off of the present inequalities in resource endowment of different areas of the world and tend to minimize existing differentials in the provision of needed supplies of materials. Access or

possession of natural resources as traditionally conceived will then no longer exercise a major role in world economy and politics. At the same time, the importance of man as a resource will increase. Regional differences will very likely be even more closely related than now to the ability of human beings to make effective use of the materials at hand.

Wisdom and prudence

What does all of this mean in terms of policy? Before we can expect resources to be used with wisdom and with prudence, far more knowledge must be gained about the intrarelations of resources, of the consequences of alternate ways of using them and of the present value attributed to their future use. This is so irrespective of economic systems or political factors altering the decisions made on resource allocation.

Take, for example, the scientific understanding on which our land management practices are based. Although much effort has been devoted to the prevention of soil erosion in the U.S. during the last 25 years, little is actually known about the process responsible for the movement of sediment across a land mass, particularly how the soil particles are carried out of the soil by water. Similarly, it has been a tenet of U.S. conservation policy that underground water storage is

affected by surface treatment. The extent to which this assumed relationship is valid has still to be established; experts today agree that much remains to be learned in this area. Yet another basic relationship about which there is a serious lack of knowledge is that between plant growth and climate.

Important influence

No less serious are the deficiencies of current attempts to spell out the social, economic and political consequences of different patterns of resource use. One may have misgivings about either the possibility or the desirability of the U.S. government enforcing a comprehensive resource management policy in the future. The government, it is true, is committed to a great variety of measures which exert an important direct influence upon the allocation and use of our resources. Collectively, however, they do not add up to a comprehensive resource policy. Some of the measures run counter to others, and a number of the major lines of effort, as has been suggested, are either unsupported or are contra-

dicted by current scientific knowledge.

In the years ahead, the acquisition of additional knowledge should prove to be a decisive force influencing the decision-making process in this area. Even though the future advance of science necessarily remains immeasurable, the pursuit of knowledge in this field will be progressively more organized and systematic, and effort will be more consciously directed to the consolidation of major scientific breakthroughs.

The increasing importance of scientific advance in determining future resource use will tend to lessen existing national and regional differences. For the growing importance of technology to resource development will surely travel around the world without the restraints currently distorting the world-wide movement and use of resources. It is encouraging to think that if the world survives its present crises, the current inequalities in natural resource distribution may not be as disruptive to mankind's aspirations as they are today. ■

Forgery gets More Difficult

A LOUISIANA BANK is offering personal checks imprinted with a photograph of the account owner. Double photos for Mr. and Mrs. identification are available for joint checking accounts. This should make many lady shoppers think twice before changing their hair style for the holiday season.



uphill progress

In the struggle for economic growth, developing countries are faced with similar obstacles

by Daly C. Lavergne

■ UNTIL A FEW YEARS AGO, there was little official governmental concern over the plight of peoples in the developing areas of the world—areas where more than half of the world's population live. Events since the end of World War II have changed all this.

Stirred by awakened demand for human betterment, the people of these countries have discovered that they can contribute to modern society both material resources and their potential when trained in science and modern technology. Demanding recognition and advancement in a hurry, they refuse backwardness as a way of life.

In basic facilities, institutional factors, and in age-old habits of

thought and conduct, the process of change is gaining momentum in all developing countries today. Some nations are still in the process of shedding the inhibitions of centuries, while others have already reached the transitional stage and are well along the road of social and economic advancement. The change brings with it a complex of problems. Some of these, fortunately, are recognized as problems of international concern and responsibility which must be faced by the Free World. This fact gives local leaders wide access to enlightened assistance from the more advanced nations, and, as a result, we are witnessing more than ever before the significant

spectacle of free peoples working together at solving problems of development.

What are these growth problems faced by the developing nations? How do the people themselves in these countries see these problems? What is being done about them?

High on the list is the political factor. Aside from performing a number of basic functions, such as maintaining law and order, governments of developing countries are also becoming involved in the production process by providing basic services and facilities to the economy. They also play a key role in the development and maintenance of "economic climate."

Policies and objectives

In many instances this has made it necessary for governments to reorient former policies to current growth objectives. This is especially true in areas where regulating powers are involved and also in matters of taxation, borrowing, lending and spending.

Other problems limit the rate of economic progress in these countries, even in those with enlightened leadership. In every one of the developing countries there is still a serious lack of teachers, school houses and general educational facilities. The outlook in this respect, however, is full of hope mainly because the problem is recognized by the people themselves. Public budg-

ets reflect this fact. International cooperation is also effective in this matter. Aside from the fundamental need of teaching people to read and write, attention is also being given to the problem of helping people acquire knowledge so as to enable them to engage effectively in their occupations.

In the broad field of education, current emphasis is also on the promotion of *economic* knowledge. Until people can understand their own economic problems, they cannot be expected to cope with them constructively. They themselves must see the meaning and value in savings, increased productivity, new industrial development, and in the role of government.

The scope and pace of economic advance in the developing countries is also limited by the scarcity of executives and trained individuals. Without adequate direction and know-how, the energies of millions of people cannot be effectively utilized. Significant in this picture is the technical cooperation these countries receive from one another, as well as from agencies supported by the U.S. With this assistance, local leaders and technicians are learning to adapt the obtained know-how and information to their own conditions and requirements.

Good health, a basic factor in economic development, is also getting high priority and effective international assistance. In recent

years the number of medical personnel, laboratories, clinics and hospitals in these countries has increased considerably, as has the use of modern techniques, medicines and equipment.

Housing is also receiving attention by the leadership in practically all of the developing countries. Low incomes and high initial cost of adequate housing, however, have required these governments to supplement private capital in facing this basic problem.

Growth requires "climate." The task of improving this climate is not easy. In practically all of these countries, adequate transport, communication and power facilities must be constructed or improved, fresh water supplies, adequate sewage disposal and housing assured, and the training of workers undertaken. Furthermore, incentives of various kinds must be provided and roadblocks to foreign private investment removed. These governments are fast learning that private capital cannot be induced; it must be attracted.

Need for capital

All of the foregoing puts the spotlight on the need for capital—and plenty of it—in these underdeveloped areas. Without adequate capital land and labor would also lose much of their meaning in terms of increasing output, creating jobs and assuring all-around

human betterment. Where is the capital development to come from?

It is generally recognized that as much as possible of an economy's expansion must be financed from domestic resources. But in most underdeveloped countries the need for funds for productive investment is greater than the economy's capacity to save. In some instances local funds remain immobilized simply because attitudes toward savings have yet to be developed to any degree, because of institutional deficiencies, and because government policies to promote a flow of funds into development are lacking.

Given the limited availability of indigenous capital funds, and their inadequacy to cover requirements, these countries are, in varying degrees, dependent on outside financial resources, private and public. For some time to come the predominant need will be for public capital, since many of the necessary development projects require large amounts of capital on which returns are either nonexistent, low or long in coming. Without capital additions, the most desirable levels of investment could not possibly be maintained; the most effective use could not be made of local resources, human and material.

Putting capital into the economy, of course, does not of itself assure economic growth. Also involved are technical ability to use

capital equipment, the capacity to distribute and consume increased output, and the ability to compete in available markets.

Underdeveloped economies are invariably weighted in favor of agriculture. Very often they depend heavily upon the sale of commodities abroad for earnings needed to finance indispensable imports. Such commodities are often few and their prices unstable. Any sharp variations, particularly drops in market prices, can produce serious instability in an economy. Moreover, the ability of a developing economy to maintain a desirable level of exports, and to obtain favorable terms for them, goes to the heart of its economic stature.

Then there is the effect of developmental activities on the structure of domestic prices. Any upward movement of domestic prices and money costs which greatly exceeds the rise in real income could seriously impair the growth pattern.

The experience of developing nations has shown that economic expansion cannot be pushed at any cost. Where this experience is disregarded the consequences can create serious problems, social, political and economic. Wise leadership has come to recognize this. It is now part of the book of "experiences."

The leadership (and increasingly the people) of these developing

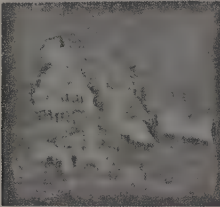
countries is coming to recognize that actions must be guided by the "reality" of a nation: its present stage of development, known indigenous resources and human capabilities.

The leadership in these areas is also beginning to understand the need to maintain socioeconomic balance; to modernize institutions to channel savings into desired investment; to expand production of goods and services to maintain sufficient margin between output growth and population (with due regard, however, for the capacity of the country to absorb increases in the output of the economy). Indigenous leadership is further recognizing that government and private consumption must not eat up the increases in the nation's output of goods and services; nor must economic gains be siphoned off and out of the country or precious capital resources wasted. In all of this activity the direction of development programs must always be kept in mind. Development must be directed toward goals that can be accepted by a free people.

In brief, the factors mentioned are ones for which the leadership and people of developing countries now maintain a conscious respect. Good insurance of this can be found in sound and realistic planning. In this way, organization, cooperation, balance and direction are more easily assured. ■



the role of government



by John Chalmers

**Policies to encourage economic growth have become
an increasingly important concern of government**

■ ONE OF THE persistently debated questions in any developing democratic country is the role of government in economic growth. In the United States, the discussion began with Hamilton and Jefferson, and it is still going strong.

What the proper role of government should be depends on what one believes constitutes the good society and on one's confidence in government as a means of improving society. As men's views on these matters change, so do their views on the proper role of government.

When the United States was founded, it was generally agreed that the first task of government in the field of economics was to unify

the colonies into an economic whole, an integrated, functioning economic unit. With this end in mind, the struggling nation turned to government to promote our infant industrial base through tariffs and subsidies.

Then, as the nation developed, public opinion called on the government to regulate excesses, to curb monopolies and to allow freedom of economic opportunity for all. The next shift in government duties in economic affairs came with the depression of the 1930s, and the resulting unemployment and business recession. Here, the public made the government responsible for promoting satisfactory levels of employment, output

and prices. Formal recognition of this changing view of the proper role of government came with the Employment Act of 1946.

The contemporary economic problem centers on growth, however. The government is being increasingly charged with the responsibility of insuring the steady expansion of the nation's economy. This has not always been the case. Before the advent of the East-West struggle, few Americans were interested in questions of how best to stimulate economic growth on a wide front, or whether the economic growth being experienced was of the best kind.

Political and economic

Today, the American people have come to realize that, for both political and economic reasons, this country must at least stabilize and maintain, if not increase, its economic growth rate. At the same time, we know that our economy has been progressing by fits and starts, often growing in directions that neither build the defense strength we need nor provide the necessary balance in our material and human resources that support a continued and accelerated growth rate.

Our interest in economic progress has long stemmed from the desire to create conditions that make possible an improvement in the qualitative aspects of life; to

reduce the constraints to personal development imposed by economic need. Now the international challenge has forced us to regard the maintenance of a markedly increased rate of growth as an imperative for national survival.

An inherent difficulty of determining a satisfactory growth rate is that the quantities being measured include fads, foibles and fins, as well as "fundamentals." A predominantly market economy does not automatically allocate its resources to meet survival needs. We should, therefore, not only evaluate our performance more realistically, but we should be more imaginative in the use of government institutions to encourage growth.

Our government must take positive action. This involves a widespread informational effort to overcome public indifference to the serious problem of our inadequate growth rate. It requires generous financial support for basic research, on which economic progress ultimately depends. It demands that government actively promote the improvement of our human resources, particularly through encouraging greater support of education.

We must allocate more of our resources to education, particularly to higher education, if we are to have the human resources needed for an accelerated growth rate. Although Congress has talked at

great length, it has failed to act decisively in financing education at any level. Clearly, neither private resources nor narrow tax bases can supply the finances to meet this national need.

Unpalatable taxes

It necessitates the reduction or elimination of restraints to growth whether they result from the exercise of monopoly power on the part of business or labor. It may become necessary to use unpalatable discriminatory taxes to discourage growth in particular areas of the economy which markedly interfere with the fulfillment of our security needs, unless our rate of growth is sufficient to allow such luxury output.

The government should sponsor and pay for a much higher level of basic research in our universities, in private research organizations and in existing government research agencies. For example, total research expenditures in the United States increased to approximately \$10.2 billion in 1958, or approximately 10 times the total 15 years earlier. While the government financed approximately 45 per cent of this expenditure, the total figure remained only some 2.2 per cent of the national income. More important, basic research in contrast to research on product improvement and development has amounted to less than a tenth of

this over-all total—a figure that is far too low.

In addition, we should consider creating government-sponsored productivity institutes to stimulate research for industries where increases in output appear particularly necessary. Such productivity institutes would be created only where private financial support was lacking.

In addition to supporting basic research and education, the government should see that the application of research and inventions is not held back by either business or labor. Competition in industry must be maintained. Prices should be responsive to market forces; restrictions on output, by whomever imposed, should be removed; market sharing should be eliminated and artificial barriers to entry lowered.

Much that has been written on economic growth has stressed the necessity of savings for a high rate of capital formation. Clearly, the nature of this problem, and the appropriateness of public action, depends on the level of development already attained by an economy.

In contrast to countries where low per capita income makes saving very difficult, our high income level permits great quantities of individual and business saving. As our incomes have gone up, so has our net saving, increasing to approximately \$31 billion in 1957.

Net savings are the source of capital addition and technological innovation, both of which are major sources of economic growth.

The amount of net saving may be more or less than the amounts required for a desirable growth rate. When savings are too high, levels of employment and output decline, depressing economic activity and retarding growth. Under these conditions, the government should initiate monetary and fiscal policies to raise consumption and investment spending to levels consistent with high employment and satisfactory growth. When net saving is inadequate for our growth needs and inflationary pressures threaten the economy or financial sources are inadequate to meet investment needs, the government should accumulate substantial tax surpluses to constrain consumption and release resources for the capital goods industry.

Basic growth requirement

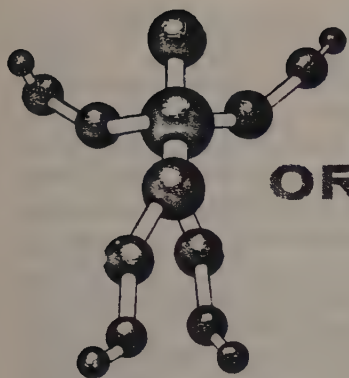
Net saving in a high income economy permits but does not cause capital formation. In an economy that relies primarily on private decisions to govern investment spending, the maintenance of satisfactory business conditions is a basic growth requirement. Government is a tremendously powerful agent in influencing the business climate. Inequities in the tax structure, excessive tax rates

and wasteful government spending stunt economic growth, while the reverse of these conditions is a stimulant to growth.

Acting wisely, the government can favorably influence the rate and direction of our economic progress. Equally important, however, in the "race between civilization and catastrophe" is better performance by the government of functions already delegated to it. Progress itself, in outmoding current ways of doing things, is destabilizing. The government must pursue fiscal and monetary policies which mitigate major fluctuations in employment and output levels, and it must nurture the development of institutions to make change less costly in social, economic and psychological terms. The technologically unemployed must receive more realistic compensation and retraining if they are to have socially useful roles in other areas of the economy.

Our challenge is to come up with the intelligence and discipline to foster a desirable and necessary rate of economic growth—and to do this within the framework of the democratic freedoms that we cherish.

Failure to meet this test successfully would mean that the real objective of economic progress—the opportunity for a more meaningful and useful life for all—will be lost. ■



ORGANIZING GROWTH

by Kenneth E. Boulding

Unconscious evolution, conscious direction—or both

■ AS WE LOOK around the world, both of nature and of man, we observe two broad types of growth and change. The first might be called organizational growth. This is the kind of growth that transforms the egg into an embryo, the embryo into a fetus, the fetus into a young animal, the young animal into a mature animal and the mature animal into a corpse. It is the type of growth also which transforms an idea into a plan, a plan into a proposal, a proposal into a young organization, a young organization into a mature organization and a mature organization into extinction.

The second might be called ecological or evolutionary growth. This is the process by which in the mutation and selection of innumerable individuals, each following its own pattern of organizational growth, the whole pattern and com-

position of individuals changes. Atoms give rise to molecules, molecules to viruses, viruses to cells, cells to animals, and animals proliferate and differentiate themselves on the long road that leads through fish, reptiles and mammals to man. Man in turn forms families, tribes, states, corporations, churches, businesses, trade unions, federations, and so on, in a pattern of ever-increasing complexity and richness.

Measuring either of these forms of growth is a matter of some difficulty. In the case of organic growth, we usually have some rough measure of the size of the organism or organization—normally, weight or volume in the case of the organism, and members, capital value or net worth in the case of the social organization. But no single measure is ever quite satisfactory. In the case of the biologi-

cal organism, a mere increase in weight is obviously not "growth" in the same sense as the orderly "balanced growth" of the youngling into the adult.

Similarly, organizations can exhibit obesity of the membership list and firms can have inflated balance sheets. In most cases, however, it seems not to be too difficult in practice to distinguish "true" from "false" growth and to get a measure which is good enough to indicate at least the direction.

Youth and vigor

Organizations can renew their youth and vigor in ways which do not seem to be open to the higher animals. Because men die, organizations need not. Death (and retirement) removes persons from the organization and permits their replacement with younger and perhaps more vigorous types. Consequently, the very processes which result in the death of the biological individual may perpetuate and even augment the species or the organization.

A good deal of current world controversy between communism and capitalism, and also what may be even more important in the long run—subcontroversies within each of these world systems—revolves around the relative merits of organizational versus ecological growth patterns as applied to the economic system.

The classical "capitalist" pattern of economic growth is ecological rather than organizational. New economic species are supposed to arise through the mutational activities of the entrepreneur, who creates a new type of commodity, an improved method of producing an old commodity, or an improved form of organization. These improved forms feed voraciously on the profits which their temporary market situation gives them and grow at the expense of older and less-advanced forms. Railroads dispossess the stagecoach, and the bus and the truck displace the railroad, much as the mammals displaced the reptiles.

The competition of all producers for "food" in the shape of consumer purchases insures, ostensibly, that only the ablest and most progressive forms of economic organization will survive. The price mechanism, which operates to shower profits on those who are most successfully meeting the needs of consumers, likewise operates to remove these profits as soon as maturity and conservatism make them unnecessary. The test of survival is the ability to sell, and it is hoped that the ability to sell corresponds closely to the desirability of the sale.

In the classical "Communist" pattern, on the other hand, society is conceived as a single organization or a "one-firm state." The sur-

vival of any particular suborganization or pattern of production within this giant body depends not so much on its ability to command income from sale of product, as on its ability to command a budget allotment in the over-all plan.

Ability to conform

Growth in this case originates with that group at the top of the hierarchy which has control of the budgets of the whole society. In such a society the "success" of an organization depends, in part at any rate, on its ability to conform to the plan sent down from the central agency.

Neither of these ideal types exists or ever has existed; but they are useful extreme concepts with which reality may be compared. Even in the most capitalist of countries there has been a considerable attempt at self-conscious control of the destinies and growth of the society by those in government who felt themselves peculiarly responsible for the whole. In the United States, for instance, commercial policy, land policy, immigration policy, reclamation policy, educational policy, and even military policy have constantly been framed with the rapid development of the society in mind; in part, our success may be due to good fortune, but good management has at least played *some* part in it!

By contrast, Communist socie-

ties are not as monolithic as they seem at first glance. Traces of the market institution exist everywhere in overt or covert form, and the will of the planners is frequently frustrated by the intractability of the planned—especially in agriculture. This is not to deny, of course, the very real differences between the two types of society. But it is by no means inconceivable that these differences will become less as time goes on.

Capitalism has certainly shown a remarkable capacity for developing institutions of centralized control without losing the essential flexibility of the market economy. Communist societies seem to be more hag-ridden by dogma and subject to more ideological rigidity. But even Russia under Lenin adopted a New Economic Policy of limited free markets, and Poland at least seems to be moving in that direction under its present rulers.

There may be very good reasons for this hope of convergence of communism and capitalism. If biological systems are anything to go by, both ecological and organizational growth play an important part in the over-all pattern of development. There are large elements of unconscious organization in the body which bear some analogies to a price system. The growth of the body is not planned in detail by the central planning committee of the genes; it follows

certain loosely defined "payoffs." The heartbeat and the growth patterns of the body are wholly outside self-conscious central direction.

There seems to be an optimum combination of unconscious and conscious processes in any organism, and this may be true also in the social organization. Whatever the position of the balance, however, a balance there must be, in the social as well as the biological organization. It may be, indeed, that as organizations become larger and more complex, more and more of the ordinary operations must be taken over by unconscious and automatic processes.

When it comes to the question of the relation of different social systems to economic growth, it is clear from the record that a system's position on the ecological scale tells us very little, in itself, of the system's growth performance. Both capitalist- and Communist-oriented systems have shown high rates of growth, and both have also shown stagnation. As far as growth is concerned (quite apart from the human costs of growth in terms of violence, insecurity and repression), Communist Russia has done well. Communist China, if reports are to be trusted, has done very well; Poland and Hungary rather badly; and East Germany very badly.

On the other side, the United

States has done very well, along with Japan and West Germany. Conversely, most of Latin America has done quite badly.

It is clear that the essential ingredients for rapid economic growth may be present—or may be absent—in almost any type of economy; neither the free market nor the planned economy can guarantee it.

Ecological growth, whether in the biological or the sociological world, depends on the number of viable mutations. In social life, the mutant is the innovator—the man who does something different from what has been done before, or is being done around him. The institutions of a society, even a free market society, may be such that the mutant is penalized to the point where no innovation pays off. Then there will be no economic growth.

Will to grow

Similarly, in organizational growth the combination of the will with the power to innovate is crucial. Organization concentrates power in the upper echelons of the organizational hierarchy. If the powerful have a strong will to grow, as in Russia and Communist China, the power and the will may move together, and high growth rates will result. A large proportion of resources will be devoted to human and material investment and, in spite of the al-

most inevitable inefficiency of very large-scale organizations, the society will move forward. The concentration of power, however, increases the chance of serious mistakes, such as the forced collectivization of agriculture in Russia, Britain's African groundnuts and even, dare we say it, the Edsel!

The problems of organizational growth are not confined to Communist societies. Indeed, communism can be seen as just a very extreme case of that "organizational revolution" which has created General Motors, the U.S. Air Force, the United Mine Workers, the American Medical Association, the University of California and the National Council of Churches. The crucial long-run problem here is whether the large organization can develop techniques of role-filling, especially in the process of promotion toward the higher roles, which avoid the perpetuation of a smug and conservative oligarchy through the continual promotion and replacement of like by like.

Weight of tradition

In this respect, most large organizations are still too young to tell whether this problem can be solved. The Catholic Church and, to some extent, the British ruling class solve this problem by encrusting the roles themselves with so much weight of tradition and authority that the occupant hardly

matters. In the more insecure and less well-established roles of the big corporation or the Communist state, a poor occupant can ruin both himself and the organization. The problem does not arise as long as the first generation of leaders is in power, as these are the innovators and creators and, clearly, the organization would never have grown had they not been capable of organizing its growth.

As time goes on, however, the problem becomes more and more acute. Of the large American corporations, only American Telephone & Telegraph seems to take this problem much to heart, and it is by no means certain that AT&T can solve it.

The problem of succession in a Communist state, with its immense concentration of power in the hands of the hierarchical leader, is even more frightening, as the case of Stalin illustrates dramatically. Even the problem of the aging and deterioration of the occupant of a powerful role becomes more intractable as organizations grow in size, and one ends with the horrible vision of a world's destiny in the tremulous hands of a small group of sick, old men.

For these reasons, if for no others, I confess to a certain prejudice in favor of ecological growth and the kind of institutions which permit it. It is the imperceptible forces which, in the long run, are

often the stronger. "The tumult and the shouting dies, the captains and the kings depart." Conquerors and dictators flash like shooting stars across the backdrop of history, but the great tidal movements of intellectual, technical, economic and social change sweep on.

Population explosion

The invention of DDT, by controlling mosquitoes and thereby setting off a human population explosion in the tropics, may have more impact on human history than the Russian or Chinese revolutions. This does not mean, however, that man's attempts to control the destiny of his societies and his race are all doomed to total frustration.

It is the mission of the intellect to make the latent manifest, and to bring out into the light of conscious knowledge what has been

lurking in the dark. A people that thinks it knows where it is going, and has a clear idea of its future, has an advantage over one that does not, even though its image may be false and its prophets deceivers.

We will not get anywhere without a ticket to somewhere, and though mankind has had plenty of tickets to nonexistent places, to nirvanas and heavens and utopias and classless societies, the search for the right ticket continues.

Because of the almost complete irreversibility of the growth of knowledge, therefore, it may be that the long run lies with organization rather than evolution and that intelligence will once more mold a whole universe to its heart's desire. This, however, is a long run indeed, and for the moment wisdom seems to require some bets on both sides. ■

One-Room House

ONE OUT OF every seven households in the United States now consists of persons either living alone or with others who are not related to them, according to figures compiled by the U.S. Bureau of the Census. This represents a record high for individuals as distinct from family groupings. A major factor in the growth of these individual households has been the rise in savings, retirement and other personal protection programs which have increased the resources of the older population. The widening of job opportunities for women has also played an important role. There is a particular concentration of these households in urban areas, where they represented a sixth of all households in March, 1959. Women are the dominant group in the classification, outnumbering men by a margin of two to one or more in recent years.

CHALLENGE INTERVIEW

GENETICS AND THE 'AVERAGE MAN'



What makes people different?

Can we control heredity?

Can we make a perfect man?

Are all mutations bad?

Is human nature changing?

THEODOSIUS DOBZHANSKY

Professor of Zoology, Columbia University

TURN PAGE →

Challenge Interview

Q Dr. Dobzhansky, as one of the world's leading geneticists, will you please tell us what geneticists actually study?

A Genetics was defined by the author of the term, the English naturalist William Bateson, as the study of heredity and variation. Genetics studies the laws of transmission of heredity and the laws of variation which distinguish individual people and other living organisms from each other.

Q As a study, genetics has really been a going concern for only the past half century. What have geneticists done since then which should be of interest and concern to the lay public?

A The accepted date for the beginning of genetics is the year 1900, when the laws of Mendel were rediscovered. Now, as far as man and the human problem is concerned, genetics is trying to find out some of the reasons why people are different. Just what makes one individual different from another? And what can be done, or could be done under favorable circumstances, to make the human populations conform more closely to what we believe might be more desirable than the present situation?

Q Well, what does differentiate individuals from each other? What have we learned about human differences?

A These are perfectly reasonable questions which, however, are far easier to ask than to answer. In general, the thing that makes individuals of any species of organism different is a combination of genetic and environmental factors. Different individuals have different genes, or to use a more popular term, different natures. Different individuals, no matter how similar in their social, economic or personal background, always live and develop in different environments.

Q *So what can we say about the relative importance of heredity and environment?*

A This is an ancient problem which has generated more heat than light for many years. The reason for this is the popular misunderstanding of what heredity is and what heredity is not. The trouble is that in the English language, as in many other languages, the words heredity and inheritance mean two completely different things. On the one hand, you have legal inheritance—inheritance of property; on the other hand, you have biological inheritance. Now, very little knowledge of biology is needed to see that when you say that you have inherited from your parents a house or a piece of real estate, you do not mean at all the same thing as when you say that you have inherited from your parents an eye color or intelligence, or lack of it. What you really receive from your parents in a strict “legal” sense of the word is merely the two sex cells, an egg and a spermatozoon, and they have no eyes of any color and, as far as we know, no intelligence and certainly no musical talents. So the statement that you have *inherited* these things means something else.

“Development continues as long as we live”

Q *What does the geneticist mean by heredity?*

A In our present terminology, heredity is the genotype or a sum total of genes, and this determines the *reaction* of the developing organism to the environment. This does not apply to embryonic development alone. Development continues as long as we live. Development occurs throughout the whole life cycle from the embryonic fetal stage through infancy, childhood, adolescence, maturity, senility and death. This entire cycle is determined by interaction of heredity, of the genotype, with the environment in which the development occurs. Looked at in this way, the old-fashioned way of asking which is more important, heredity or environment, is clearly fallacious, because there is no organism without heredity, and any organism develops in some environment. Consequently, any trait whatsoever—physical, physiological, psychological or cultural—is bound to be both hereditary and environmental.

Q *Does this mean that the problem is meaningless?*

A No, of course not. But in order to have meaning the question should be stated as follows. We observe that different people have different skin colors, different degrees of intelligence, different degrees of musical ability, and so on. It is then reasonable to ask to what extent *existing* differences of genetic endowments and *existing* differences of environment contribute to these differences. Stated in this form, the problem does become meaningful and susceptible to study and experimental verification.

“Genetics is a study of heredity and variation”

Q *To what extent is it possible to apply genetic principles with predictive validity to human beings? Can human beings artificially transform their heredity?*

A I am afraid that in this case you claim too much for genetics, at least as far as human heredity is concerned. Mendel's laws do make it possible, under certain conditions and to a certain extent, to predict the probable outcome of mating individuals with different traits. As far as man is concerned, however, this sort of study is only at its very beginning. For some traits, chiefly traits of a kind which the man in the street does not know anything about, such as blood types, prediction within limits is possible. The trouble is that for traits of great social importance, this predictability is on a very much lower level. I should say that what genetics contributes in the human case is not so much predictability as, we hope, an improved understanding.

Q *And an important aspect of this is a better understanding of why people are different?*

A That is right. Genetics is a study of heredity and variation, and genetics has helped us to understand why people are all different. It is, for example, possible to show rather convincingly that no two human individuals, excepting identical twins, can ever have the same genotype, that is, the same biological natures.

Q *Is this true of other species?*

A It is true of all species which reproduce sexually and by cross-fertilization. You see, the situation is such that the probability of even brothers and sisters having by chance received the same sets of genes from their parents is so infinitesimally small that it can be completely disregarded. I believe it is fair to say, then, that genetics has supplied evidence of the absolute uniqueness and unrepeatability of every human being. You and I are individuals possessing biological natures which never existed in the past, do not exist elsewhere now and never will exist again. It seems to me, at any rate, that this is a fact of some human interest—sociological and philosophical.

Q *What, in your opinion, are some of the social consequences of this biological uniqueness in man?*

A The practical consequence of this biological fact is that the concept of average or normal man becomes, to say the least, dubious. This applies not only to social problems, but also in other fields such as medicine. For example, the assumption that a patient is a patient, and that one patient will react like the other, given the same disease and the same treatment, is certainly most questionable. More interesting for us, perhaps, is the application of this principle to education. An educational system which is good for one individual may not be so good for another. The old saying that human nature does not change is clearly fallacious. There is no such thing as human nature; there exist only human natures. Obviously what is good for one or for some human natures need not be good for others. Now, one geneticist has at one time defined democracy as practical recognition of human diversity and that, of course, is a perfectly reasonable statement.

"Different human individuals require different environments"

Q *Many people would regard such a statement as quite undemocratic.*

A I realize perfectly well that many people find it emotionally difficult to believe that biological differences among human beings can affect their psychological make-up. This emotional repulsion has at least two good (or bad) reasons. One of them is, of course, that this kind of

claim was often used in the past as a specious defense of rather unpleasant and unattractive kinds of philosophies. Then again this emotional resistance is based on the same gross misunderstanding of what heredity is, the problem we discussed before—the idea that somebody who has inherited genes for intelligence can't help being intelligent and, conversely, that the man who has not inherited such genes is destined to be dumb.

Q *What, to a modern geneticist, are the social implications of this recognition of human diversity?*

A It means that different human individuals require different environments, different educational systems, different nutritional or medical regimes, and so on, for their optimal development, however we may wish to define optimal development. Perhaps the most immediate practical consequence of familiarity with genetics would be a skepticism concerning this idea of normal or standard or average man. We have to recognize that people are different. Moreover, we have to explain to ourselves and others that these differences are not evil, but are, as a matter of fact, what probably keeps the world going. To me, at any rate, the idea of a world containing three billion people of exactly identical natures is rather depressing.

"Modifiable by both genetic and environmental means"

Q *How can genetics help us in selecting and furthering those traits which society, or the geneticists, believes to be desirable, and inhibit or eliminate those traits which we consider undesirable? Can the geneticist actually select traits which he wishes to transmit?*

A First of all, let's establish the fact that any trait is, in principle, modifiable both by genetic and by environmental means. If you knew how (but you seldom do), you could, in principle, do any job of "social engineering" by changing either environment or heredity, or both.

Q *But genetics makes no general claim for the superior effectiveness of one method over the other?*

A I should like to emphasize as strongly as I can that genetics, by no

stretch of the imagination, denies the effectiveness or desirability of social engineering. A popular misconception is that something which is genetic cannot be modified by the environment and, conversely, that something which can be modified by the environment cannot, therefore, be genetic. That is obviously not so. Sociologists, educators and economists are justified in hoping that most human natures would be reasonably acceptable under environments which are good to them. Changes in environment can, therefore, be extremely important in obtaining more acceptable human personalities.

"We need medicine and education adapted to individual needs"

Q *But the geneticist's specific concern is presumably with the genetic transmission of traits. What can his contribution be in this area?*

A Well, I think I would claim a little more for genetics. By merely pointing out the multiplicity of human natures as a necessary basis of social engineering, genetics has, it seems to me, made an important contribution. Thus it is up to geneticists to point out to an educator, let's say, that there is no education system which will be best for everybody, or to the doctor that there is no therapy which will be best for all patients. What we need is medicine and education that is adapted to individual needs, at least as far as this is possible. In principle, I repeat, one could conceive of discovering methods, medical or educational, whereby you could get something out of most, conceivably even all, human genotypes.

Q *But cannot genetics also tell us how to encourage the reproduction of certain genotypes and discourage others?*

A There are, of course, some human genotypes that we can very well do without—for example, the genotype-reproduced hereditary diseases of an incurable sort. But even here, we must not forget that what is incurable today may be curable tomorrow. In principle, nothing is incurable forever, and that certainly includes hereditary diseases. Nonetheless it is quite probable that some of these genotypes would be better off for themselves and everybody else if they did not exist. Similarly,

we may wish some time, particularly when we know more about it, to further certain genotypes—for example, genotypes which take more easily to education and training of various kinds.

Q *That is through eugenic policies?*

A Yes. Perhaps I should point out that this problem of eugenics has, in recent years, become more acute, particularly in connection with our growing knowledge of the genetic damage caused by atomic energy radiation. This problem has, perhaps, done some good to mankind by making people think about the eventual necessity of controlling human genotypes.

"Negative" rather than "positive" eugenics

Q *Well, this, of course, raises a basic social question. Who is going to decide what is a desirable trait and what is an undesirable one?*

A That is obviously a very serious problem, for a half-baked eugenic program is liable to do more harm than good. Of course, there will probably be no two people who would agree on what is an ideal man. For different individuals, the ideal man would range from some funny paper character to a saint or military hero, or what have you. Most people, however, would agree that certain traits are undesirable. There is, for example, the mutant gene in man which results in what, in effect, looks like amputated arms and legs. Or there are genes which produce hemophilia or certain kinds of insanity. Even if, as is entirely possible, methods will be found to relieve these conditions, it would still remain true that no parents would knowingly want to have a child which would have any of these characteristics. So it will probably be easier to agree on "negative" eugenics than on "positive" eugenics, although the latter is certainly more important and promising in the long run.

Q *But would not any eugenic policy—positive or negative—have to set limits on the mating desires of two people? What are the legitimate incursions that a eugenic policy could make on the right of choosing a mate which, at least in the West, is the very basis of family life?*

A Here we have to speculate about the remote future, and experience

shows that the future usually bears rather faint resemblance to the prophesies uttered in its behalf. You are, of course, perfectly right in saying that almost any eugenic program runs head on into the perfectly legitimate demand of people that certain things be left private to them. On the other hand, let's consider this fact. It has been brought out very clearly that any society which uses or will use radiation for technological purposes—and I am thinking here of perfectly legitimate peaceful uses—will have to bear a responsibility for its consequences.

Q When you speak of the genetic damage caused by radiation, you are presumably speaking of mutations. What is a mutation?

A A mutation is a change in the genetic materials which, consequently, affects the heredity of the organism. Mutations arise in all organisms from time to time and have presumably been arising since the beginning of life on earth.

Q There is a widespread belief that all mutations are necessarily bad. Is this true?

A The only possible answer to your question is, yes and no. Obviously, not all mutations are bad, because we have arisen out of an accumulation of good mutations—at least good in the environment in which we now live. But to find a good mutation among, shall we say mutations induced by radiation, is precisely like looking for a needle in the haystack. You may be quite sure that the haystack contains the needle, but to get it out is a rather difficult job. And the same is true of other mutations. Nobody in his right senses would induce mutations in human species on the chance that among the numerous ones there will be one or a few good ones.

“We do not control the kind of mutations which we produce”

Q Well, don't we know anything about the kind of environment most likely to produce undesirable mutations?

A Most, possibly even all, mutations which arise under a constant environment—that is, an environment to which the species has become adjusted—are bad. It is when the environment changes that there is some chance that some of the mutations which were bad in the original

environment may prove to be useful changes in the alternate environment.

Q Is it possible for the social engineer, as you call him, to try to create environmental changes such as would produce beneficial mutations?

A At present, the answer is definitely "no." We do not control the kind of mutations which we produce. All that we know how to do is increase the frequency of *all* sorts of mutations. And, of course, among all sorts of mutations a great majority will be bad. It is, of course, conceivable that at some time, somebody would find a technique of inducing specific mutations when and where you want them. But that time is quite remote. All you can say is that man has learned to increase the frequency of mutations, and that is unfortunate. In the atomic age, it would be a much better idea if we could find a technique whereby you would decrease them. That would be a very nice thing.

Q Still, bad mutations persist.

A Society is increasingly forced to accept the responsibility for biological bad luck—taking care of physically or mentally handicapped people. That being the case, it is really hard to see how society can indefinitely defer adoption of some rational, safe and fair policy with respect to these matters.

"Everyone tries to fill some ecological niche"

Q What would such a policy be?

A I frankly do not know, although many people who like simple solutions to complicated problems have come up with such solutions. I find it really hard to predict or even to guess how the problem will eventually be solved.

Q Isn't there a danger that when institutions such as the state begin describing certain traits as "desirable" or "undesirable," they will think of what is desirable or undesirable for the state rather than for society at large or for the individuals concerned?

A When this problem was discussed in the past, it was very frequent-

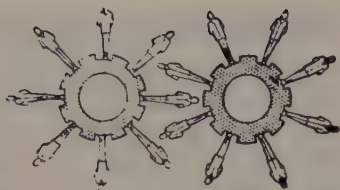
ly discussed in terms of the normal or optimal man, as if the goal of genetics were to make everybody alike. Even today, there are still some very eminent geneticists who entertain this view. But, probably, a majority will agree that what we are really after is not making everybody alike, but the reverse. In any human society there is a great variety of functions to be served. These functions represent what a biologist would call ecological niches. Everyone of us is trying in his life to fill some ecological niche. Now, if you take this into consideration, you will understand why standardization is undesirable for the development of any society and is particularly unfavorable in a complex society. Far from being an evil, as some people believe, genetic human diversity is actually a great boon. Seen in this light, the difficulty which you have pointed out is a little less serious—at least in the long run. Right now, we may wish to have more of a certain kind of people, but we shall never do the foolish thing—even if we could—of making everybody alike. For, if a century hence we change our minds and recognize a different kind of diversity preferable, it will still be possible to reconstruct the genetic basis of humanity accordingly. And one thing we can be quite sure of is that the requirements will change in the course of time.

"Prophecy is a dangerous business"

Q *One final and highly speculative question. If, as you say, human nature is constantly changing, in what direction is it changing?*

A To answer that question requires prophecy, and prophecy is a dangerous business—unless you prophesy things which are so remote that you cannot be proved wrong. In this case, I would rather keep this question deliberately open. After all, let us be optimistic enough to believe that in, shall we say 200 years, people will be wiser than we are, and they will regard us with a certain amount of tolerance as semi-illiterate barbarians who really did not know what was good or bad for them. But let's hope that they will at least credit us with having tried to do what we could to the best of our ability.

Q *Thank you very much, Dr. Dobzhansky.* ■



Technology and the Future of the Economy

Progress depends heavily on technological developments, although we must recognize their destructive potentialities, as well

by Gerhard Colm

■ THE INTERRELATIONSHIP of technology and economic growth is an interesting one, particularly in the manner in which one begets the other.

In this context, we are concerned primarily with the relationship of the applied sciences to economic growth, even though we recognize that all applied sciences depend on the availability of a flow of knowledge from the basic sciences. Applied sciences or technology contribute to economic development in two different ways: first, by creating new or improved consumer goods and, second, by developing new or improved methods of production. The automobile or the washing machine or the television set are examples of the first kind. Irrigation and contour plowing, standardization of parts, replace-

ment of manual by mechanical energy, assembly line production, scientific management, automation, are examples of the latter. There are, of course, interrelationships between the two kinds of technology. Often the development of a new product gives rise to a new method of production, and conversely a new method of production, at times, makes it possible to develop an improved product. For example, the automobile, a new product, gave occasion for the development of the assembly line method of production. Similarly, the adoption of automatic controls in the petroleum refinery process permitted the development of greatly improved petroleum products.

One of the crucial questions regarding the future concerns the

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relationship between the labor-replacing and labor-absorbing effects of the new technological revolution. Improvements in processes of production free human labor and thereby make possible the production of new and more products. Improvements in agronomy, for example, have made it possible to increase the supply of food while using less labor (considering both the labor used on farms and in production of chemical fertilizers and farm implements). Thereby more labor becomes available to meet the needs for improved shelter, clothing, and other manufactured products and services, and in addition to satisfy the desire for shorter hours of work. However, there may not always be a balance between the labor-saving effects and the job-creating effects of new technology.

Let us assume that a country's economic activity consists only of agriculture and that manufactured goods and services are unknown. Let us assume further that great progress is made in the methods of agricultural production. Despite the decline in the costs and prices of agricultural products, the extent of an increase in demand for food is limited. As a result, technological unemployment or underemployment may develop.

If, however, manufactured goods are introduced and offered to the consumers at the same time that

technological advancement in agriculture is taking place, then total demand may be so stimulated that the workers no longer needed in farm production may find ample job opportunities in industry.

While a new consumer good often supplants an old one (e.g., the automobile in place of the carriage), the adoption of a new product usually results in a net gain in demand and employment opportunities.

In a similar way, new jobs are created if the advances in agronomy lead many farmers to buy and use a new kind of farm implement. In such instances, the technical innovation will, for a period of time, result in a new increase in employment opportunities. The economic history since the first technological revolution demonstrates that the job-creating effects of innovations have, in general, exceeded the labor-replacing effects.

Some people, however, have expressed great concern that the new technological revolution may not bring about that fortunate balance between these two effects of technology. There are fears that rapid advances in the methods of production—particularly the adoption of automation—may result in technological unemployment of a magnitude which could not easily be offset by the creation of new job opportunities for the production of new consumer goods and for the

production of new machinery.

For the near future, it is likely that industrial research will create more job opportunities than it will abolish. Not only the development of new and improved consumer goods, houses and services, but also the replacement of obsolete industrial equipment is likely to open up more job opportunities than will vanish as a result of the use of labor-saving devices. In the long run, however, more of the benefits of technological advances should not be taken for granted. A science development program should, therefore, include studies of the effects of technology on the labor market, on changing requirements for skills, on the need for promoting labor mobility, and on

the hours of work and the related problems of leisure time.

Some economic analysts have taken a skeptical view concerning the basic proposition that continuing economic expansion is desirable. They fear that the need constantly to develop new products as an offset to labor-saving innovation leads to a situation in which new products do not satisfy real needs but only needs artificially created by the "hidden persuaders." They fear that we are becoming the slaves of a technology which teaches us to produce goods with less labor and then requires great human ingenuity for the invention and adoption of new goods in order to keep the economy running in high gear. John Kenneth Galbraith

Research and Development

IN 1958, about \$10 billion was spent on research and development in the U.S., almost double the amount spent only five years before. Research and development has become one of the nation's major industries—largely because of the research efforts of private industry. American industry performs about 75 per cent of the nation's total research and development and pays a little over one-third of the cost. On a scale unthought of two decades ago, private enterprise has committed its tremendous resources to developing and improving materials, products and processes through research. . . The principal reason for this tremendous expansion in industry research is obvious: private industry has learned that research pays off. The payoff may sometimes be in the form of a short-term return on the research investment, but business management often justifies research expenditures because they contribute to stability and continued growth over the long run.—"The Responsibilities of Industry" by John T. Connor in *The Scientific Revolution*.

warns that we are drifting in that direction and that our economic process is becoming as meaningful as the squirrel wheel.

Truth and exaggeration

Galbraith's views, in my opinion, contain both truth and exaggeration. True, mankind has lived and died on this globe for quite some time without automobiles, airplanes, telephones, television, air conditioning, washing machines, wonder drugs or space travel. Yet we may also say that animals have lived for quite some time in the water before they learned to live on the land or fly in the air. Millions of years of evolution were needed to develop these faculties which existed as potentialities in the animals of the sea. The human race has telescoped into short periods of time the process of developing new potentialities and new dimensions of living. In some Oriental cultures, innate nature was overcome by spiritual mastery over the body; in our culture we have learned to extend our innate physical abilities by intelligent control of the forces of nature. Making the most of given potentialities is a value deeply rooted in every living being. The human squirrel wheel, absurd as it appears, may be a vehicle spurring mankind to move towards that objective.

This emphasis on the creative aspects in our technological age is

not in any way intended to deny the justified criticism of the many foolish things that people have been persuaded to buy. It is healthy to take a skeptical view of many articles offered to us through the highly developed technique of "persuasion." It is healthy that we recognize that there are other things than technical achievements which contribute to a full life, and yet such healthy skepticism should not lead to an overlooking of the creative role which scientific development can play in the life of mankind, either by wholesale destruction or by creatively opening up new possibilities and dimensions of life.

There are other more tangible reasons why technological advances may be of greater significance than appear under the symbol of tailfins.

Claims increasing

With rising population and steady industrialization occurring all over the world, claims on natural resources are increasing. This is likely to lead to a secular increase in the real costs of resources, such as water, fuel and some metals. Industrialization raises the social overhead costs for providing means of transportation, for education and training, for the purification of the air and for many other purposes. On balance, an increase in productivity, that is an increase in output per worker, can

be expected to continue only if technological advances can make very substantial cost reductions possible.

Finally, in recognizing that we in the highly industrialized countries are enjoying the benefits of an "affluent society," we should remember that two-thirds of mankind exists at or near bare subsistence level. These people no longer live in geographic and cultural isolation, and they have become aware of how the other third of mankind lives. People everywhere see the abundance of a minority of mankind before their eyes, but for them affluence is a rather elusive mirage. This is a fact of greatest importance for the American position in the world. Advances in technology must be seen not only in our own domestic perspective but also in the perspective of the rapidly growing populations in many of the less-developed countries. The same advancement in agronomy which adds to our own embarrassingly high output of certain agricultural prod-

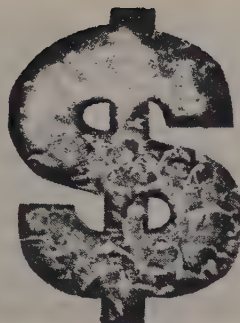
ucts may make the difference between life and death for millions of people in overpopulated and technologically underdeveloped countries. Thus many improvements in production which could only be developed on the basis of Western science and technology may find their most essential application in other parts of the world.

Some of the advances of science (e.g., reducing the mortality rates without providing corresponding increases in production) have contributed to the problems of overpopulated areas. These problems may become unmanageable unless science and technology contribute their full share to the fight against misery, disease and ignorance. It is essential that we recognize the destructive as well as constructive potentialities of science and technology. Helping to solve the problems which have been aggravated by the advances of science has become not only a demand of humanitarian concern but also a question of the survival of Western civilization, if not of mankind. ■

Answers to Challenge Quiz

- | | |
|----------------------------------|-----------------------------------|
| (1) False (<i>see page 20</i>) | (6) True (<i>see page 10</i>) |
| (2) True (<i>see page 6</i>) | (7) False (<i>see page 40</i>) |
| (3) True (<i>see page 53</i>) | (8) True (<i>see page 67</i>) |
| (4) False (<i>see page 14</i>) | (9) False (<i>see page 50</i>) |
| (5) True (<i>see page 33</i>) | (10) False (<i>see page 61</i>) |

DOES
INCOME
EQUALITY
AFFECT
GROWTH?



by Bert F. Hoselitz

The answer depends on the stage of development a country has reached

■ THE "HAVE NOTS" who envy the "haves" frequently advance the argument that an equal distribution of wealth—presumably for a greater spread of purchasing power—would not only benefit the majority of mankind, but would be the best stimulant to vigorous economic growth.

Invitingly simple, this argument leaves unanswered more questions than it resolves. One of the first to point this out was the Italian-Swiss economist Wilfredo Pareto, who some 60 years ago discovered that income distribution followed a common, uneven pattern in many countries. He found that the highest five per cent of income receivers earned about one-third of a country's income, while another third was earned by the lowest 60 per cent of income receivers.

Since Pareto found this unequal distribution of income so prevalent,

he speculated that even if the distribution of income were made equal by law, society would soon again return to an unequal income distribution if people were left to their own devices. Because of this, he believed that only by increasing the total product of a society could the lower classes receive a greater share of the national income.

In subsequent years, the validity of Pareto's theory was widely debated. Most economists, particularly those with socialist leanings, found it unacceptable, but others paid attention to Pareto's proposition that inequality in income distribution could be reduced *if* a society's total income increased. There is now some fairly convincing evidence at hand that this is what has happened, at least in some of the most advanced countries.

For example, in the United States the wealthiest fifth of the

population received 55 per cent of the total national income in 1929, but only 44 per cent in 1950. At the same time, the share of the poorest three-fifths in the national income rose from 27 per cent in 1929 to 34 per cent in 1950. Similarly, in Britain the top 20 per cent of income earners received 54 per cent of the total income in 1929, but only 45 per cent in 1947. During this same period, the income share of the bottom three-fifths rose from 31 per cent to 36 per cent.

Important conclusion

All the above figures, it should be noted, are based on income *before* taxes; and since in both the United States and Great Britain progressive income taxation has become steeper since 1929, current income distribution after taxes is even more equal than the figures suggest.

One important conclusion to be drawn from these facts is that in an economically advanced country, where living standards are high, the rate of economic progress is greatly affected by the rate of increase in consumption and, in particular, the purchase of durable consumer goods. Unless an increasing number of families in the lower-income groups can afford to purchase durable consumer goods (houses, appliances, furniture and fixtures, automobiles), advanced

economies cannot generate enough demand to employ fully the extensive capital resources in production.

This makes it necessary that income be distributed widely enough to provide a large part of the population with sufficient earnings to be able to buy these goods. And even though they may not be able to buy most of them outright, they may acquire these goods on the installment plan. A crucial factor in preserving stability and insuring the potential for economic progress in an advanced, high-income society, therefore, is the share of total consumption expenditures devoted to durable consumer goods.

In a poor society in which economic growth is just beginning, any sizable expenditure on durable consumer goods is out of the question. Not only do people in a poor society spend most of their income on the most perishable kinds of consumer goods, namely food, but the money which they spend on durable goods goes primarily for productive machinery and other forms of capital goods rather than for durable consumer goods.

This is one of the reasons why most poor societies have such abominably low standards of housing, and why the furniture and other fixtures found in a typical home are of the cheapest and most primitive kind.

Yet, it may be argued that in-

come distribution in a society with a low rate of capital formation ought to differ from that in a society with high living standards already established. Why? Because capital is formed out of savings, and it is generally observed that distribution of savings is even more unequal than the distribution of income. In a poor and underdeveloped country the majority of the population is usually too poor to make any voluntary savings whatever. Even if the income of the poorest 90 per cent were augmented, the people would still not make any appreciable savings.

In such countries, only a very small percentage of income re-

ceivers is able to save. It is their savings which provide the source of capital formation so crucial for economic development. Therefore, a more equal income distribution in underdeveloped countries might seriously impair the capacity for economic expansion.

Assets and income

So far, we have discussed the relationship of income distribution and the capacity for economic development in different countries on the assumption that capital assets are owned by private individuals who derive income from that ownership. But in many underdeveloped countries a substantial portion

Reaching for the Nearest Star

"SUPPOSE that some space vehicle could be created which could go at the constant speed of 25 miles per second (90,000 miles per hour). How long would it take this vehicle to travel from the earth to various points in space?

<i>To go to</i>	<i>the time required is</i>
the moon	2.9 hours
Mars	16 days
the sun	43 days
Uranus	780 days
Pluto	4.5 years
Alpha Centauri (nearest star)	30,000 years
Andromeda Nebula (nearest spiral galaxy)	15,000,000,000 years

All points *within* the solar system are well within reach of our imaginary vehicle in times reasonable compared to a human lifetime. But the 25 *thousand* miles per second required to bring the nearest star within reach is not in sight."

-Lee A. DuBridge, "Space Exploration: How and Why?" in *Science and Resources*, edited by Henry Jarrett, The Johns Hopkins Press, November, 1959.

of capital formation is undertaken by government. Obviously, the share of income from property that accrues to the state and not to private persons will be larger.

In any case, although the share of state-owned productive capital assets is greater in underdeveloped countries than in most Western countries, income is more unequally distributed in underdeveloped countries than in most advanced countries. For example, we have found that in the United States, in the post-World War II period, the top fifth of the income range earned 44 per cent and the bottom three-fifths earned 34 per cent of the total income. In India during the same period, the top fifth of the population earned 55 per cent of the total income, while the bottom three-fifths earned 28 per cent.

Historical evidence

But what changes take place as a nation moves into industrialization? Evidence compiled to date suggests that whatever type of economy a nation may have when it embarks on industrialization, income distribution tends to become less equal during the early phase of industrialization, then gradually more equal as industrialization progresses.

But does the historical evidence apply to the underdeveloped nations of today? After all, the social and income structure of Europe,

and of countries settled by Europeans at the time they began to industrialize, was more equal than it is in nonindustrial countries today. In fact, the contemporary underdeveloped nations are most likely to have an extremely unequal income distribution. Their populations may be divided into two major groups, one small and the other very large.

The former is composed of a small elite which enjoys a virtual monopoly of wealth and income, political power and education; the latter is made up of a large number of peasants, servants and others in menial positions. A middle class is almost entirely absent and, to the extent it exists, is often made up in large part of foreigners.

In countries like the United States or Britain, we may assume that income in the 17th and early 18th centuries was more equally distributed than later, and that the period of greatest inequality occurred during the earliest decades of industrial development—from 1800 to 1850 in Great Britain, and from 1840 to 1890 in the United States. After these dates, inequality probably diminished until it reached the current situation.

In Latin America and many Asian and Near Eastern countries, the general process of economic development has probably brought about a steady though slight diminution of income inequality. If

the pattern of the more highly advanced countries is repeated there, this trend is likely to continue.

Final points worth noting are the ways in which greater income equality has come about during industrialization in Western countries. First of all, along with economic expansion has come extensive inheritance taxation, resulting in the fragmentation of large accumulations of wealth. Also of importance in this process has been conspicuous consumption among the wealthy and the gradual abandonment of Puritan values by them.

Urban growth

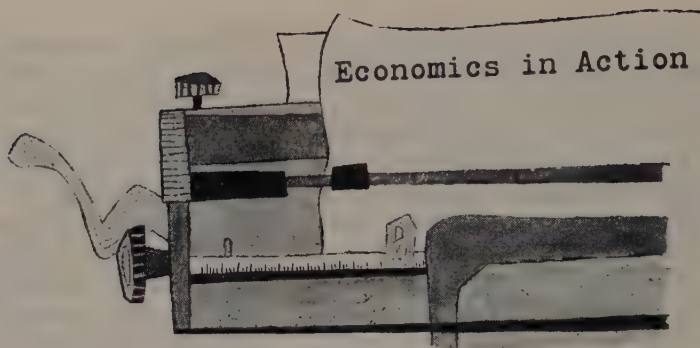
But most important seems to have been the process of urban growth, which brought into being a better-educated, socially more conscious and more politically effective lower-class population. These circumstances permitted the native urbanites to adapt themselves better to economic competition, to form organizations (such as trade unions) furthering their aspirations for more income, and to secure a greater share of the total income than they would have obtained without this education and capacity for organized social action.

Moreover, the political pressures exercised by urban masses stimulated various sorts of protective legislation, much of it designed to counteract the disruptive effects of industrialization and urbanization.

This growing income equality has had a series of interesting effects in social and cultural relations. We have already seen that consumption patterns have become more equal and that many goods, which at one time were outward signs of wealth, have become widely distributed even among middle- and lower-class families. At the same time, some students have observed the beginnings of a mass culture—that is, of a homogeneity in tastes and a vulgarization of the arts to the least common denominator. Clearly, a more equal distribution of economic rewards may have its advantages and its drawbacks. There is every indication that in the more highly developed countries of the West the trend toward more equal distribution of income will continue. For some this may raise the awe-inspiring question as to whether or not the wealthiest countries of the world are going to pay for their increasing economic equality with a simultaneous self-exile into a cultural wilderness. ■

Is the Washington Monument Aluminum?

ALUMINUM, one of the earth's most abundant metals, is found in most common rocks except limestone and sandstone.



**strike
effects**

The economy was feeling the first serious effects of the steel strike by early November. About 350,000 workers, in addition to the 500,000 strikers, had been laid off. Most of these were in the auto industry. General Motors, for example, furloughed approximately 185,000 employees. Ford, however, was in a slightly better position, since 50 per cent of its steel needs are supplied by company-owned subsidiaries. The steel companies themselves suffered heavily, with both Bethlehem Steel and U.S. Steel reporting losses of better than \$30 million in the third quarter.

**railroads
hard-hit**

Another hard-hit sector is the railroad industry—already beset with declining passenger revenues and a rapidly approaching deadlock in the bargaining sessions with the brotherhoods. The principal issue in the negotiations is the perennially vexing question of featherbedding. At the end of October, seasonally adjusted freight carloadings were down to 80.2 per cent of the 1947-49 average, as opposed to 82.7 per cent the month before.

**pressures
against
settlement**

The strike has lasted twice as long as any previous national steel strike for a variety of reasons. Even though there is a strong market for consumer goods, steel's biggest customers have not exerted the strong pressures for a settlement that they did in the previous postwar strikes. These companies are willing to

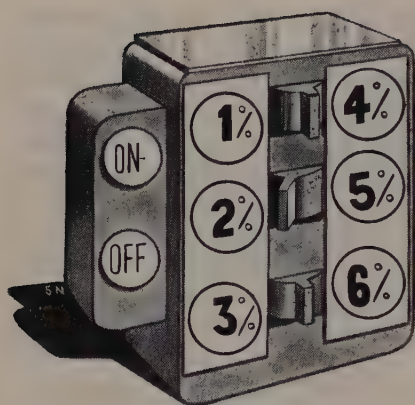
suffer temporary losses because they feel the steel outcome will determine the pattern for labor agreements in other industries. These firms also feel they will be compensated for current losses by a pent-up demand for their products after the steel impasse is resolved. Although the principal roadblock to an agreement is the thorny issue of workrules, other pressures hampering a settlement are the Administration's opposition to another inflationary price rise and Senator Kefauver's threat to have his Antitrust and Monopoly Subcommittee investigate the steel industry if such a rise occurs.

**tight
credit**

In spite of the increasingly tight money situation, outstanding consumer installment credit reached \$37.5 billion in September, \$4.4 billion greater than a year ago. Investment in new plant and equipment also rose in spite of high interest rates. The seasonally adjusted total at annual rates for the third quarter was \$35.3 billion compared with \$29.6 billion in last year's third quarter. The continuing demand for credit, in the face of higher interest rates, could be a harbinger of new inflationary pressures after the steel strike is resolved.

**the
outlook**

Any economic prognostication for the last quarter of this year and the first quarter of 1960 is inextricably tied to the outcome of the various labor disputes. Even if there is a steel settlement by the end of the year, we are faced with the strong possibility of a nationwide railroad strike some time this winter after the exhaustion of the built-in strike delays of the Railway Labor Act. A resumption of the East and Gulf Coast dock strike after the December expiration of the 80-day Taft-Hartley injunction is a distinct possibility. Either a railroad strike or a dock strike would seriously hamper recovery in steel, assuming that the strike is settled. A rail strike would practically paralyze steel shipments while a dock strike would impede ore shipments to the mills. ■



As nonbank institutions
increasingly finance growth,
control becomes more difficult

by Charles L. Schultze

Can the Fed Really Control Credit?

■ WHILE MOST of us remember, if somewhat dimly, the admonition "neither a borrower nor a lender be," we are by now willing to admit that the rapid growth of our economic system has been brought about in part by the growth of "credit."

Equally important to this economic growth, however, has been the control exercised over credit—the devices by which the federal government seeks to regulate the amount of money available, and thus avoid the crises of under- or overexpansion. The Federal Reserve Board regulates discount rates and, indirectly, reserve requirements for banks. The Treasury, through its refinancing of the national debt and through its tax policies, works to the same goal—

the control of the amount of lending which can be done by American banking institutions.

As the nation's economy has expanded and savings have become more widely distributed, the non-banking institutions, such as life insurance companies, savings and loan associations, credit unions and pension funds have come to provide a steadily increasing percentage of the money loaned for industrial expansion. Meanwhile, the percentage of such money loaned by banking institutions has decreased. The federal government thus finds itself increasingly unable to control those financial institutions which, in fact, do a significant part of the money-lending on which industrial expansion depends.

The implications of this are

clear: operating as it does under rules established 46 years ago at the birth of the Federal Reserve System, the federal government is gradually but surely losing its ability to promote noninflationary economic growth through monetary management.

To understand the nature of the problem, let us examine the relationship between the growth of credit and the growth of a nation's economy. Of prime importance in the economic development of a community is (1) the willingness to save and to invest, and (2) the technological opportunities open to it for improving production methods. A third important requisite is finance, for without the financial institutions to transfer funds from saver to investor, an economy would soon stagnate.

Now, as our economic system grows more complex, an identity between those who save and those who invest becomes less likely. Those in positions to utilize investment opportunities seldom if ever have sufficient personal capital available for investment. They must therefore call on the savings of others for the money needed for the investment. Unless this money can be efficiently mobilized and channeled to those who have investment opportunities, the rate of investment will be reduced, and economic growth slowed or halted.

And, if income growth is slowed

or halted, the amount of saving will also be reduced; for, in general, people tend to save more as their income goes up. This means that, if saving cannot be channeled into productive investments, the resulting reduction in income will lead to less saving. Thus an economy with an inefficient financial mechanism wastes its saving potential.

Suppose, for example, that the mass of saving done by people in relatively modest circumstances could not be placed in banks, savings and loan institutions, or life insurance companies which, in turn, could make the funds available to investors. People would have to invest their savings directly in the securities of business firms or in mortgages. Under these circumstances, a large volume of savings would go to waste; people who would accept a three or four per cent rate of return on their savings in a savings and loan association, for example, would be much more cautious about investing their money directly in a particular bond or mortgage. At best, the mortgage would have to pay a substantially higher rate of interest; a more likely result would be that the mortgage could not be placed at all. Thus, with the financial mechanism of the society failing to fulfill its task, the real possibilities for growth could not be realized.

As we have seen, business firms

or individuals wishing to invest in real assets—i.e., property—more than can be provided by their own saving, must obtain funds from other firms or individuals whose opportunities for investment in real assets are less than their saving. Those who provide the funds acquire claims on the assets purchased by those who use the funds. These claims can take a number of forms; notes to a lender, stocks, bonds and mortgages. As the nation's stock of plant, equipment, housing and other physical assets grows, so also does the stock of financial claims used to finance the acquisition of those assets.

"Direct claims"

The claims issued by a business firm or individual to finance its investment program we shall call "direct" claims. The purchase of such claims by savers is, however, not the only, or even the most usual, way in which funds are transferred from savers to investors. Financial institutions arise which purchase the direct claims of investors and, in turn, issue their own claims. These securities represent indirect claims on the real tangible assets of the nation; they are, in reality, claims on claims. Among such institutions are savings and loan associations, insurance companies, credit unions, etc.

A savings and loan association, for example, acquires funds by is-

suing shares to depositors, who thus receive a claim on the assets of the association. The funds acquired this way are in turn used to buy "direct" claims, mainly mortgages. Thus funds are transferred from savers to investors, not directly, but through the savings and loan association.

There are a number of reasons why such financial "intermediation" has grown rapidly throughout our economic history. The small saver is reluctant to buy securities directly since this would involve putting all his eggs in one basket. By putting his savings into a financial institution, he is able to buy a pro rata share of a diversified portfolio. Moreover, the "indirect claims" which he purchases are normally more like money than an equivalent amount of direct securities; that is, they are easily converted to cash with little or no risk of loss. In the case of life insurance, the saver is purchasing a liquid (i.e., "moneylike") asset—the cash value of the policy—as a part of a larger asset (financial protection for his beneficiaries).

Specialized financial institutions have thus proliferated by creating specialized types of indirect claims appealing to particular needs and preferences of savers. These institutions play a major role in the growth process, since they enable savers to provide funds for investors under conditions of safety and

security otherwise impossible. As a result, those who have the opportunity to make productive investments have access to funds mobilized from countless sources on terms far lower than would be possible if the only connection between savers and investors were that of direct offer and purchase of claims.

Because it provides a means of channeling savings into real investment projects at the lowest feasible interest rates, a complex of financial institutions is necessary to an optimum rate of economic growth.

Financial claims have played an increasingly important role in the financing of the nation's economic growth. In 1860, financial assets were 43 per cent of the value of real tangible assets, while by 1952 this figure had risen to 110 per cent. This rise in financial claims relative to real assets reflects the growth of indirect financing—direct claims of investors purchased by financial institutions who in turn issue indirect claims to their own depositors. Moreover, a growing proportion of indirect financing has been undertaken by institutions other than banks—life insurance companies and savings and loan associations in particular. And within commercial banks, time deposits have grown substantially in proportion to demand deposits.

We have seen that the mobilization of savings by financial institu-

tions who purchase claims from investors (including government) and issue more liquid securities of their own to cover their purchases, contributes in a significant way to economic growth. But the ability of such financial institutions to create highly liquid assets complicates the problems of monetary policy.

Unforeseen contingencies

People hold money balances as a means of payment, as a reserve against unforeseen contingencies, and as a pool of purchasing power to take advantage of unforeseen opportunities. If the only choice open to individuals were holding money or relatively risky securities, it would require a substantial increase of interest rates on business securities to persuade them to finance new investment from their cash holdings.

In that case, the monetary authorities could, by controlling the amount of money available to people, make sure that any attempt by business to invest at too rapid a pace would soon result in a sharp rise in the rate of interest. Thus the volume of *spending* could be held within noninflationary bounds by keeping the supply of *money* under control.

With the growth of nonbanking financial institutions, however, this control has been substantially weakened. Now the sale of securities in a volume greater than the

flow of savings no longer entails the same significant reduction in individuals' liquidity. For the difference between holding money and holding a savings and loan share is nowhere near as great as the difference between holding money and holding a mortgage. Financial institutions attract funds to purchase securities by issuing their own very highly liquid claims to individuals. Thus, one need not exchange money for a relatively illiquid security such as a mortgage; one may purchase the mortgage indirectly by exchanging money for a highly liquid asset, e.g., a deposit in a savings and loan association.

Two purposes

Money serves two purposes; it is a medium of exchange and a liquid store of value. In its second role it can be replaced, with little loss of liquidity, by the securities of financial institutions. By controlling only the volume of bank money the monetary authorities hope to control the volume of spending. But since money, in its second role, can also be created by nonbank institutions, economic units can "economize" on bank money; so long as these other financial institutions are free to create money substitutes.

The growth of nonbanking financial intermediaries raises two kinds of problems with respect to na-

tional economic policy. The various state and federal laws limiting the kinds of securities which may be purchased by various financial institutions should be re-examined. In many cases such laws were designed for the protection of depositors in the event of a 1930s' type depression. In an economy which can be safeguarded against extreme fluctuations in income, many such restrictions have outlived their usefulness, and quite probably impede the efficient flow of funds through specialized institutions to the general capital market.

It may also become necessary to provide a central control over the asset-creating activity of such institutions, analogous to that exercised over commercial banks by the Federal Reserve System. The National Monetary Commission, sponsored by the Committee for Economic Development, is currently engaged in a review of the effectiveness of existing monetary controls. The rapid growth of financial institutions, with the ability to create highly liquid assets, clearly is among the most important phenomena which must be encompassed in such a review.

Many difficulties

The control of nonbank financial institutions is fraught with many difficulties. The type of control required is not one which tells the financial institutions *how* to use

their funds, but one which can determine the over-all volume of securities or claims purchased by these institutions.

At the present time, the basic means of controlling the volume of loans and investments made by the commercial banks is through raising or lowering reserve requirements; that is, the amount of reserves in relation to deposits that the banks must have at the Federal Reserve banks. A similar form of control over the total *volume* of claims which might be issued by other financial institutions would, of course, have to take into account the particular characteristics of each of the major types of institutions. Indeed, a detailed study of

the problems involved might suggest a completely different form of control for nonbank financial institutions.

The central problem at the moment is simply to recognize that our monetary and credit system has changed significantly since the Federal Reserve was established some 46 years ago. Unless we are willing to rethink the whole issue of monetary controls in the light of changed circumstances, as did the men who laid the groundwork for the Federal Reserve System, we shall find our ability to promote economic stability and growth through monetary management gradually but surely slipping away from us. ■

The Advantages of Wealth

"WEALTH is not without its advantages and the case to the contrary, although it has often been made, has never proved widely persuasive. But, beyond doubt, wealth is the relentless enemy of understanding. The poor man has always a precise view of his problem and its remedy: he hasn't enough and he needs more. The rich man can assume or imagine a much greater variety of ills and he will be correspondingly less certain of their remedy. Also, until he learns to live with his wealth, he will have a well-observed tendency to put it to the wrong purposes or otherwise make himself foolish.

"As with individuals so with nations. And the experience of nations with well-being is exceedingly brief. Nearly all throughout all history have been very poor. The exception, almost insignificant in the whole span of human existence, has been the last few generations in the comparatively small corner of the world populated by Europeans. Here, and especially in the United States, there has been great and quite unprecedented affluence."

—From *The Affluent Society* by John Kenneth Galbraith. Houghton Mifflin Company, 1958.



THE PERMANENT FRONTIER

No. 20: how the boom of the
Twenties gave rise to the
depression of the Thirties

■ THE GREAT CRASH of 1929 and Great Depression of the Thirties hit the American economy with a shock that reverberates a generation later. What caused 1929 and its agonizing aftermath? Have we learned much from these events? Can anything similar ever happen again?

The general smugness with which the United States viewed its economy through the Twenties was not so foolish as hindsight might at first suggest. It was plausible to view the brief financial panics of 1873 and 1907, the slight prewar slackening, and even the 1920-21 recession as mere ripples on a strong stream of growth. Many have, in fact, regarded the three "rolling readjustments" since World War II in exactly this comforting light. Wars, likewise, had spurred rather than ravaged our economy.

Optimism was particularly easy

under the boom conditions of the Twenties. Growth, to be sure, suffered mild setbacks in 1924 and 1927, but the recoveries were swift. Industrial production, as measured by the Federal Reserve index, had pulsed upward by approximately 50 per cent over 1922 levels. Expenditures on new plant and equipment in manufacturing alone were at or above \$2 billion since 1923. Manufacturing wages continued their slow but steady rise. Craft union workers in the expanding building and printing trades did even better. There was virtually full employment, and even a slight reduction of hours in the industrial workweek.

The driving forces behind the impressive statistics were a set of ripening technological innovations.

This is the 20th article of a series in CHALLENGE which deals with the history and development of the United States economy.

Interacting developments in manufacturing techniques, power, transport and communications stimulated waves of new investment and economic growth. With the technical came in time *social* revolutions or, at least, marked changes in the American landscape and ways of life.

Automobiles were a key force. Their big change from novelty or luxury status occurred largely in the Twenties. The introduction of more reliable closed cars at lower mass-production prices greatly expanded the market. Auto registrations jumped from less than 2.5 million in 1915 to more than 26.5 million by 1930. Installment buying set the pace for the acquisition of other consumer durables in similar fashion. Hosts of service businesses arose along the burgeoning road systems. Urban centers were joined more closely with rural and vacation areas. From the cities began the mass trek to the suburbs.

Tremendous market expansion, with corresponding investment, was induced in such supporting industries as steel, rubber, glass and petroleum. Highway construction more than offset the declining role of the railroads. The building boom carried over into houses and apartments, commercial and industrial structures.

Assembly line techniques and mass marketing spread into a wide range of consumer goods indus-

tries. There was coordinate progress in the electrical and chemical fields. Total output of electrical power, for example, doubled between 1923 and 1929. Advertising, via the new radio and other growing mass media, also doubled in size during the decade as it became a billion-dollar-a-year industry.

Established trends with regard to the composition of the labor force became more pronounced. Agricultural workers declined, absolutely and relatively, while the proportion in the service fields increased. Urban blue- and white-collar occupations grew at the expense of unskilled work. Larger enterprises, and organized combinations of these, were the rule. The new middle class of technicians, executives and the self-employed was greatly expanding its desires for comfort, variety and leisure.

The total economic picture was not entirely rosy. Farmers, it will be recalled, were still generally mired in a long-range depression, even though many borrowed to get new equipment. Their plight was relieved only slightly by sporadic legislative efforts. The South was a huge region of poverty, as were the urban immigrant slums. Nor was the total distribution of income very equitable by present standards.

The seeds of depression germinating midst the genuine prosperity of the 1920s were in part the

usual ones present in any boom. Contributory causes included various so-called "monetary" and "real" factors, domestically; certain vulnerabilities in the international economy; and, of course, public attitudes and moods.

Weak structures

Among the monetary causes may be listed the easy money policies, speculation in the securities and real estate markets, and exceptionally high indebtedness. The banking and corporate structures were weak, and there were inappropriate, befuddled wage reactions. Real factor analyses focus generally on opposite blades of the same pair of scissors: on "overinvestment" and on "underconsumption." Psychologically, we had huge confidence in, but appalling ignorance of, the economy. Chief international sources of weakness were the faulty interwar mechanisms of world finance and the primary commodity price instabilities.

As in all such complex occurrences, no one group was necessarily a (or *the*) villain. The Federal Reserve authorities, for example, have been blamed much for their permissive role toward the speculative excesses of the Twenties. Much of the credit flow, however, appeared to them beyond their control. Their concern for European trade recovery also called for credit liberality. The

Reserve's securities position may, in any case, have been inadequate for the required magnitude of open-market operations.

Granting even some will and ability to exercise proper control, judgment was frightfully difficult to apply in those times. A bubble, as Harvard Prof. John K. Galbraith puts the matter, is far more prone to sudden puncture than careful, gradual deflation. Men who knew that "the real choice was between an immediate and deliberately engineered collapse or a more serious disaster later on" preferred drifting a bit longer to reaping immediate antagonism. This sort of problem is, of course, ever with us.

Speculation, in these twilight days of the older individualistic capitalism, came in its way to be respected behavior. Many common stocks had been undervalued during the early stages of the boom. Real estate speculation followed broadened participation in the stock market. These promotions were only slightly mitigated by the complete demise of the partly mythical Florida land boom in 1928.

As securities prices doubled again from 1926 to 1929, speculation depended increasingly on borrowed funds. Pyramiding through holding companies gave still more leverage. Price-earnings ratios in such cases shot out of all proportion to reality. The eventually expected falling away of confidence

erupted—for sundry unknown reasons—in the autumn of 1929 in particular. The cumulative downward flood of margin calls carried the financial collapse well into 1932.

Suspended payments

More than one-fifth of the nearly 24,000 banks in the United States in 1929 suspended payments during the 1930-32 asset deflation. Half of these failures took place in rural settlements of less than 1,000 population, reflecting and compounding the agricultural distress. Businesses held wages steady for a while, then let them fall; in both instances, probably, at the wrong time.

Several indices of real production had begun to drop before the initial 13-million-share, "Black Thursday" market crash of October 24, 1929. Construction reached what later could be seen as a major turning point in 1928; industrial production in the summer of 1929. These downturns climaxed seven years of intensive construction, equipment accumulation and manufacturing activity. A major portion of the then available effective demand had been fulfilled, if not out-run. This fact in itself would produce at least the usual minor inventory recession.

Too many other forces pushed downward in 1929 to let the economy off so easily. National income contracted almost 40 per cent; un-

employment reached 15 million. With firms as a whole not even covering their capital depreciation, net investment (real capital formation) became uniquely *negative* in 1932, on the order of several billion dollars. These developments, of course, unfolded later than the big slumps in the securities market, with enough lag so that they ought not to be interpreted as causes of the initial market calamities.

Looked at another way, the mass-consumption breakthrough of the Twenties had not been mass enough. The boom in cars, houses, appliances and other consumer durables was highly dependent on a relatively narrow population base. Wage earners had not shared adequately in the decade's large productivity increases, as compared with the rentier class. They could not bolster the consumer market quite enough, on which depended so many of the producers' investment plans.

Economic insight

All of these forces happened to occur at roughly the same time, in an era when economic insight was poor and the will to bold public policy was lacking. The incipient depression was transmitted abroad and rebounded by causing declines in our export industries. Neither fragile postwar Europe nor the chronically weak primary producing countries could maintain their

import flows from us in the face of the collapse of world trade and finance.

Much as a healthy man may be felled by several diseases which he could easily overcome one or a few at a time, this combination of unfavorable circumstances accounts for the unique sharpness and length of the depression which followed 1929. The passing of the Twenties was marked by a strange unanimity that conditions were "fundamentally sound." Prosperity would soon return, *if* we were only wise enough not to tamper with the economy. There was a corollary statement, more prevalent somewhat later: even if recovery might take longer than at first expected, tampering with the economy would only court further troubles.

Severe gaps

Paradoxically, gaps in the understanding of our economy were far more severe than generally realized at the time. Statistics required for economic intelligence were laggard and incomplete. It was only later, for example, that national income and product accounting was developed for policy use. Sector accounts are now regarded as essen-

tial for appraising what is happening in the economy.

Far worse was the basic ignorance or confusion about what are now regarded as rudiments of monetary and fiscal policy. Both parties, it may be recalled, wooed the voters in 1932 with promises of a balanced budget, and both had vague fears about a world without the gold standard.

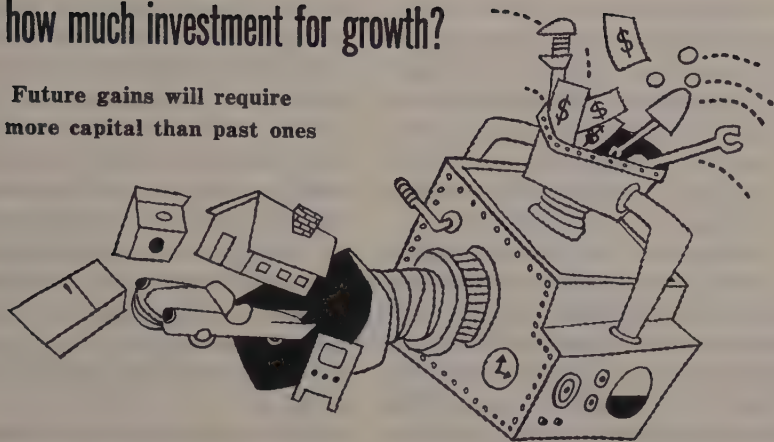
Many specific reforms of the New Deal and after reflected explicitly some detailed lessons that were learned from the Twenties with regard to the banking system, corporate structure, consumer purchasing power and international economic relations. Negatively, the experience of the Twenties showed how easily speculative fever and pompous ignorance can seize even good and distinguished men.

It may be too simple to relax in the conviction that such frenzy cannot happen again. No responsible observers claim, even now, that all business fluctuations can be eliminated. There is merely some reason to believe that we can, with proper policy, keep disturbances within fairly narrow bounds. Our gains in knowledge should justify more confidence. ■

NEXT MONTH: the economic lessons of the depression

how much investment for growth?

Future gains will require
more capital than past ones



by Sergei Dobrovolsky

■ ECONOMIC GROWTH depends on an expanding supply of capital goods. Obviously, there is something lacking if an economic system cannot generate enough capital formation to meet replacement needs and, at the same time, expand its capital stock enough to maintain per capita output to meet population growth. The rate of capital expansion may be reduced, of course, if capital saving innovations are made. But the very term "economic growth" implies a higher rate of capital formation than that which merely maintains the status quo.

Is there such a thing as the desirable rate of capital formation? In the planned economy of the Soviet Union, the government, largely for noneconomic reasons,

has been straining the nation's resources and capabilities in order to achieve the maximum possible growth rate.

In our decentralized economic system, it is the individual investor who decides on whether to consume or save—and his decision will vary from time to time, depending upon the attractiveness of these alternatives. Since there can be no "ideal" ratio between consumption and saving, all one can ask of a free economic system is that it provide facilities for the highest rate of capital accumulation consistent with the people's propensities to save and invest.

How does our record measure up against this yardstick?

According to a series of studies initiated by the National Bureau of

Economic Research in 1950, roughly one-fifth of our gross national product was devoted to the creation of capital goods between 1869 and 1955. Expressed in constant prices, this ratio has declined from 22.6 per cent in the period 1869-88 to 17.6 per cent for 1946-55.

The ratio of capital consumption—that is, depreciation—to gross capital formation increased markedly over the same period. As a result, the ratio of net capital formation—that is, excluding depreciation charges—to net national product has declined sharply.

Capital-output ratio

The ratio between total capital stock and annual output rose in the early decades, but declined in the more recent ones. Thus, for all industries combined, it took on the average \$3.2 of capital (net of depreciation) to produce \$1 worth of product (in terms of value added) in the 1869-88 period, \$3.6 in 1909-28, but only \$2.5 in 1949-55. In manufacturing, the capital-output ratio went up from 1.5 in 1880 to 1.8 in 1900 and to 2.5 in 1919, but then declined to 1.8 in 1937 and to 1.6 in 1953.

These changes can probably be attributed to the fact that in the early decades the economy of the U.S. was transformed from a predominantly agricultural base to a modern industrial one. In both existing industries and newly

formed industries, many mechanical devices and processes were developed to replace manual operations. The development of large plants and mass production required a more rapid increase in fixed capital than in other factors of production. Large plants, built in anticipation of increasing demand, were often operated well under capacity levels for a considerable time. All of these factors made for a higher capital-output ratio.

But as our industrial economy came of age, more efficient use of capital tended to lower this ratio. Many capital-saving innovations were made: machines were made to operate at greater speeds, to last longer, to perform with fewer breakdowns, to consume less power and raw materials, etc. "Scientific management" methods became increasingly popular: buildings designed for specific operations, improved lighting, rationalized plant layout, mechanization of intraplant movement of materials, etc.

More recently, we have witnessed the increasing use of electronic devices in "automation." Now automation is not only labor-saving (in the sense that it reduces the amount of labor per unit of product), it is frequently also capital-saving. Reduction in floor space, with the accompanying reduction in lighting and heating requirements, is one example.

But we do not yet know how strong and widespread the capital-saving effect of automation has been so far—or how important it will prove in the future. Nor can we predict how widespread industrial use of atomic energy, which would pose major re-equipment problems in the power industry and elsewhere, is going to affect the capital-output ratio.

Internal financing

In any case, we can be sure that industrial demand for capital equipment will be relatively high in the near future. Will the supply of capital funds be adequate to meet this demand?

American industry has generally been able to meet a major part of new capital requirements by internal financing—that is, through reinvestment of undistributed profits. During the 1949-59 period, gross internal financing (retained net profit, plus depreciation and depletion allowances) of all nonfinancial corporations totaled \$222 billion, or more than two-thirds of total new financing—while the funds obtained from all external sources amounted to only \$107 billion.

During the interwar period, there was much speculation whether the relative share of internal financing was increasing. The data now available indicate only a slight upward trend in the ratio of in-

ternal to external financing for all corporations since 1900, and this trend is mainly accounted for by the behavior of the regulated public utility industries. No distinct trend has been observed in manufacturing and mining.

There have, however, been considerable cyclical fluctuations in the internal-external ratio. Periods of rising profits have usually encouraged business firms to expand capital assets at a high rate, and this has required external funds in addition to the capital generated internally. Such has been the case in most postwar years.

Gross internal financing provides funds for both replacement and expansion. Ideally, depreciation reserves should correspond to the amount of capital consumption and thus provide adequate funds for replacement needs, while retained net profits should be available for expansion requirements. But annual depreciation allowances, made by the usual accounting methods, seldom, if ever, equal the actual annual amount of capital consumption.

In a period of continual price rises, moreover, total amount of depreciation accrued over the entire lifetime of a machine may fall short of the amount required to replace it. Thus industry spokesmen often claim that book depreciation has been inadequate and, therefore, that reported net profit has been

considerably overstated. Economists, on the other hand, have pointed out that when capital stock is expanding in real terms, the rise in actual replacement expenditures may lag behind depreciation accruals by a considerable margin. These two factors pull in opposite directions; which is stronger depends on how the rate of real capital expansion compares with the rate of price change. Rough estimates indicate that retained net profits, even after a liberal adjustment for underdepreciation, have been a substantial source of funds available for net investment in the postwar years.

Problem of "oversaving"

The supply of external funds is related to the volume of personal saving. The amount of personal saving was especially large during the World War II years; it dropped sharply during the immediate postwar period, but rose rapidly again during the last decade. However, the combined demand for external funds of all economic sectors has been so strong that the problem of "oversaving," which troubled the economists in the prewar period, is no longer a live issue. Some people are now concerned about the possibility that the saving-generating capacity of our system may not be sufficient to maintain a satisfactory rate of economic growth in the future.

Not all personal saving is available for investment in domestic industry. Substantial amounts go into residential construction and, in some years, into net purchases of government securities and net foreign investment. These funds also contribute to the nation's economic growth. A growing economy requires an expansion of residential facilities for its labor force. It also requires an increasing amount of public expenditures on transportation facilities, educational programs, etc. Similarly, foreign investment may contribute to our own economic growth by creating conditions favorable for the development of our foreign trade.

Still, expansion of domestic industry's capital stock is clearly the primary condition of our national economic development. Domestic industry's share of personal saving has, in recent years, been limited less by the level of investment yields than by investors' requirements with respect to safety of their funds. Preferring conservative investment media, the suppliers of external funds have tended to turn to bonds.

Several factors have been responsible for this trend. Many individual investors suffered heavy losses during the depression of the Thirties and have remained cautious, although, in recent years, there has been a reversed interest in stock as an inflation hedge.

More important, an increasing proportion of personal saving is being channeled into industry through financial institutions, especially insurance companies and retirement funds, whose investment policies are restricted both by law and custom. These institutions have been obliged to put their funds primarily in bonds and mortgages. Although some of them are now permitted by law to invest a certain proportion of their funds in corporate stocks, the amounts involved are relatively small and the stocks acquired are generally of the conservative type.

If similar trends prevail in the near future, risk or venture capital will have to come—as it has in the recent past—primarily from the internal sources. But internal funds can only be generated in large amounts by large corporations with continuing high profits. Smaller firms, especially newly established ones, are at a distinct disadvantage in trying to attract capital funds for new and costly projects.

These firms are often the innovators of new ideas and the pioneers of new processes, while the larger corporation, in many cases,

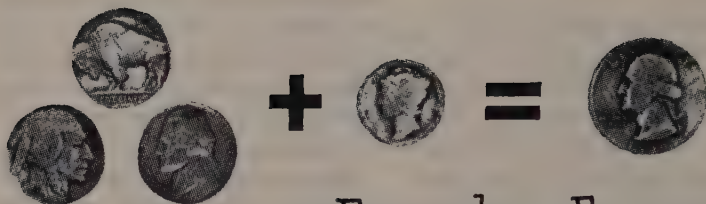
is more reluctant to accept new innovations. The channeling of more investment funds into these undoubtedly riskier ventures could conceivably be an important growth rate stimulant.

There are some financial institutions—both private and public—that specialize in financing small business. But their resources are limited. If large institutional investors were to use a considerable proportion of their total capital for the financing of smaller and younger firms, this would constitute an important new development. Since they enjoy such a wide choice of diversification possibilities, such a policy should not seriously impair their over-all financial security. But they would hardly be willing to adopt it unless adequate economic incentives were created.

The answer may be some form of additional tax advantage, to encourage investors to put their capital in these fledgling firms. This, coupled with some modification of the laws requiring institutional investors to place their funds in bonds and mortgages, may provide the external funds necessary for incipient enterprises to contribute to the national growth rate. ■

Cultivating Underwater Deserts

AT PRESENT, fertile areas of the ocean exist only where natural vertical circulation stirs up nutrients that support plant and animal life. Oceanographers have discovered that nuclear reactors, placed on the ocean floor in unproductive areas, plow up deep water nutrients and force them nearer the sunlit surface where living things can flourish.



Everyday Economics

■ SOCIAL SECURITY benefits are not paid automatically. Applications must be filed immediately after becoming eligible for benefits because payments can be made for no more than 12 months retroactively. For each month's delay beyond one year from the time the beneficiary becomes eligible, he may lose one month's benefits. The lump-sum death benefit cannot be made unless application is made within two years following the death of the insured worker.

All first applications should be made in person at the nearest Social Security field office. If a disability prevents the applicant from appearing in person, he should send his legal representative, or request that the field officer call at his home. When applying for benefits, time may be saved by bringing along the papers necessary to establish claim. All applicants must produce documents clearly showing their date of birth. A woman applying for wife's benefits must have her husband sign the application. A widow applying for survi-

vor's insurance must produce her marriage certificate.

Convention delegate?



COSTS of attending a convention may be deducted from federal income tax returns only if the delegate's attendance is a part of carrying on his trade or business. Expenses for a convention which has no connection with business interests are not deductible, even if the taxpayer is an official delegate. However, if the proceedings have some business tie-in, the delegate may claim a partial tax deduction.

Sharp shopper



WHEN shopping for shoes it is advisable to wear a comfortable pair so that the salesman can select shoes with a similar last. To check the fit of an old pair of shoes, look at the soles—the first signs of wear should show under the ball of the foot. Even adult sizes may change

between purchases, so it is best to have both feet measured. The difference in an increase of one-half size is only one-sixth of an inch.

No excuse



■ A TAXPAYER who relies on his attorney or another agent to prepare and file his declaration of estimated income tax cannot delegate the *responsibility* for filing the estimate. The Internal Revenue Service rules that failure to file is not the result of a tax counsel's error of professional judgment on a specific tax question. Responsibility rests with the taxpayer.

New plan for vets



AFTER July 1, the widow of a veteran of World War II or the Korean war will qualify for a pension, even if her husband had no service-connected disability. At present, only widows of World War I veterans have this right. Widows who will receive pensions under the new law must contact the Veterans Administration, but not until after January 1. Under the new law, veterans' pensions will be placed on a sliding scale, based on other income. An estimate of additional income must be filed with the application forms. Persons who already receive VA pensions and who

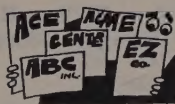
are confused by the new provisions need not contact the VA. They will receive explanations of the new program in the mail, and forms for changing to the new pension plan will be in the mails by March.

Tax note for teacher

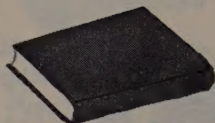


SICK PAY received by persons absent from work because of illness may be excluded from federal income tax returns. However, if a teacher becomes ill during a vacation period, when he is not expected to teach, he may not claim exclusion for payments received during the vacation. If the teacher receives payments in lieu of wages while on convalescence leave, those payments may be excluded, except for periods occurring during normal vacation time.

Changed jobs recently?



PERSONS who change jobs frequently or who have several employers should have their social security account verified once a year, particularly if they do not have receipts from each employer showing the wages paid and the amount deducted for social security. Other persons should check their accounts every three years as there are time limits for making certain corrections.—S. T.



Strategy in the Missile Age. Bernard Brodie. 423 pp. Princeton: Princeton University Press. \$6.50.

•Dr. Brodie believes that a nation which has forsworn preventive war must devote much of its military energies to cutting down the advantages an enemy derives from attacking first. This involves many things but, above all, the survival of our retaliatory power through dispersion and through the use of protective shelters. More controversial is Dr. Brodie's belief that we are more likely to be confronted with Korea-like limited wars than with a nuclear Armageddon.

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The Great Farm Problem. William H. Peterson. 235 pp. Chicago: Henry Regnery. \$5.00.

•Prof. Peterson feels that government intervention in the free market has increased agriculture's problems, not solved them. He believes that the only real surplus on the farms is one of farmers. The author is right in stating that the federal agriculture programs of the past 30 years have been a dismal failure. But his "solution" of selling all government farm inventories back to the farmers, no matter how low the price or how great the loss, totally ignores the

human and political problems of such a drastic move. How could such legislation be gotten through Congress, with its powerful farm bloc, and how would we handle the difficult problem of reallocating the services of the farmers thus displaced to other industries?

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Life in the Crystal Palace. Alan Harrington. 263 pp. New York: Alfred A. Knopf. \$4.50.

•For those who have wondered what life in a big corporation is like, as well as for those who already know, Harrington's book is entertaining and thought-provoking reading.

Protected from overwork, money worries and future insecurity, the middle management man in the "Crystal Palace" spends his business career inoffensively and unconstructively awaiting his retirement. "But," says Harrington, "if we are going to the Senior Prom, we have to learn how to dance." It is the author's conclusion that one does not learn how to dance merely by keeping afloat in a pool of syrupy goodness.

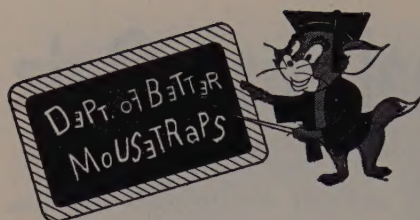
Harrington points out quite conceivably that life in the Crystal Palace cannot, in the long run, redound to the good of either industry or the nation. ■



Challenge Quiz

HOW WELL can you do with this true-false quiz? Test your ability to increase your knowledge through reading. Ten correct answers is Excellent; 9, Good; 8, Average. If you do the quiz *before* reading the articles, 6 correct answers is good. Answers on page 52.

- (1) In the United States, only one-eighth of the total annual production of electricity is destined for residential use.
True ☐ False ☐
- (2) Annual depreciation allowances, made by the usual accounting methods, seldom equal the annual amount of capital consumption.
True ☐ False ☐
- (3) The Italian-Swiss economist, Wilfredo Pareto, argued that the lower classes can receive a greater share of national income only if the total product of society is increased.
True ☐ False ☐
- (4) American families are continually shortening their savings plan programs.
True ☐ False ☐
- (5) During Lenin's time, Russia adopted an economic policy of limited free markets.
True ☐ False ☐
- (6) At the present time, research expenditures from nongovernmental sources have reached levels of almost \$6 billion annually.
True ☐ False ☐
- (7) Modern genetics have proven that some brothers or sisters have an identical genotype, even if they are not identical twins.
True ☐ False ☐
- (8) In 1915 there were more than two million registered automobiles in the continental United States.
True ☐ False ☐
- (9) New technology always creates new jobs for a greater number of workers than it displaces.
True ☐ False ☐
- (10) The U.S. Federal Reserve System is 30 years old.
True ☐ False ☐



Winter Worryland: A spray can filled with a liquid that prevents even the dampest snow from sticking to shovels, thus reducing snow-removal labor. . .A plastic tray for wet overshoes that has a ribbed bottom to permit the soles to dry. . .An infrared heater for outdoor use that looks like a fluorescent light and only heats objects in its path while the air remains cold. . .A wrap-around windshield that fits over the stroller to protect the baby from winter weather.

* * *

Behind the Wheel: An auto play shelf for children can be folded flush with the back seat. Its four feet of colored pegboard, blackboard and coloring space keep the children amused during long trips. It also converts into a meal table. . .A magnetic key holder that will hold up to three keys inside a flat metal tin. It can be stuck to any steel surface (in back of an automobile bumper, or another hiding place). . .A garage rack that permits use of the dead space above the car hood to store screens, furniture, etc. It has four steel uprights and a steel deck that expands to over 10 feet in length and will support up to 1,000 pounds.

* * *

Santa's Finds: A Christmas perfume made of myrrh and frankincense. . . A sturdy table football game with

wooden players that must be manipulated to kick the ball past the opponents and into the goal. . .A pocket calendar that works for every year from the year 1 to 2400 A.D., with the change, in 1582, from the Julian to Gregorian calendar accounted for. . .A single-runner sled made of welded aluminum that will glide on a very light snowfall.

* * *

Around the House: A moderately priced home fire alarm that is operated by two flashlight batteries. It automatically sounds a loud warning when room temperature rises to 135 degrees. The unit can be installed anywhere: during the holidays it is recommended for the room where Christmas tree lights are burning. . . A magnetic cord grip that fits into the plug end of an electrical cord to hold it fast to the side of the toaster or other steel-encased appliances. . . An apple parer that peels and cores apples when the crank is turned on the viselike gadget.

* * *

Personal Business: Shoelaces made of strong nylon which will not come untied until the owner unties them. . . Genuine wooden nickels officially issued for civic and municipal celebrations.

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Childrens' Corner: A cardboard toy kitchen with refrigerator, range, cupboard, and a sink that holds the water pumped up from a hidden container. The kitchen is "waist high to a five-year-old". . .An Army Bulldog tank made of plastic that is practically indestructible. It climbs over obstacles placed in its path.

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Write to **CHALLENGE** for further information. ■